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VICTORIAN NATURALIST:

THE JOURNAL & MAGAZINE

OF THE

Field Naturalists' Club of Victoria.

VOL. XXVI.

MAY, 1909, TO APRIL, 1910.

Hon. Editor: MR. F. G. A. BARNARD.

The Author of each Article is responsible for the facts and opinions recorded.

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THE VICTORIAN NATURALIST.

VOL. XXVI.

MAY, 1909, to APRIL, 1910.

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ERRATA.

Page 46, line 4—For "*saturalis*" read "*suturalis*."

Page 47, line 18—For "*longipenna*" read "*longipennr*."

Page 81, line 14—For "A. L. Deane, C.E.," read "Henry Deane,
M.A., F.L.S., M. Inst. C.E."

Page 115, line 11—For "tornus" read "termen."



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No. 305.

FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 19th April, 1909.

The president, Mr. G. A. Keartland, occupied the chair, and about 75 members and visitors were present.

REPORTS.

A report of the excursion to Beveridge on Saturday, 13th March, was given by the leader, Mr. F. G. A. Barnard, who reported a good attendance of members. The extinct crater known as Mt. Bland and Mt. Fraser had been visited, and the members had been greatly interested in the volcanic features it disclosed, while a number of interesting specimens of volcanic action had been collected.

A report of the excursion to Lilydale on Saturday, 27th March, was submitted by the leader, Mr. F. Chapman, A.L.S., who stated that there had been a large attendance of members and friends. Some time had been spent at the Cave Hill limestone quarry, where the general features of the geology had been studied and a number of fossils collected. Afterwards a visit had been paid to a much worn down crater near the Melbourne road, where there is a splendid exposure of volcanic tuffs.

A report of the junior excursion to the Clifton Hill quarry on Saturday, 3rd April, was given by the leader, Mr. R. W. Armitage, who took the place of Dr. Hall, who was unable to be present. He reported a good attendance of juniors, who evinced considerable interest in the geology of the quarry. Fine specimens of arragonite and ferro-calcite were secured, but zeolites were very scarce. A glance was afterwards given at the general physiography of the district.

ELECTION OF MEMBERS.

On a ballot being taken, Miss Gilbanks, Moonee Ponds, and Miss Enid Ritchie, Hotham-street, Balaclava, were elected ordinary members; Mr. Edmund Jarvis, Department of Agriculture, Brisbane, as a country member; and Master Donald Bridges, Lansell-road, Toorak, and Master Edgar H. Neal, Weybridge-street, Surrey Hills, as junior members of the Club.

GENERAL BUSINESS.

The hon. secretary stated that during the Easter holidays he

had visited Werribee Gorge for the first time since the local Progress Association had formed the pathways and effected other improvements, and said that it is possible now to see all the most interesting portions of the Gorge with very little trouble, and that ladies need not be deterred from going there by the fear of rough walking.

PAPER READ.

1. By Mr. D. J. Mahony, M.Sc., entitled "A Fossil Watch."

The author exhibited portions of a watch found some little time ago during the progress of the works at the Red Bluff, St. Kilda, and showed that, though from its make the watch could not be much more than twenty years old, it was so embedded in the sandstone that it could be truly called a fossil, and instanced the fact as proving the rapidity with which material may be formed into true stone.

Some little discussion ensued, in which Mr. J. A. Leach, M.Sc., referred to the cementing action of some tertiary beds near Coburg, and Mr. A. D. Hardy, F.L.S., to a similar action by the rocks near the Loch Ard Gorge, west of Cape Otway.

DISCUSSION.

Following up the innovation of the previous meeting, a discussion on the Hawks and Owls of Victoria was set down on the notice paper for the evening.

The chairman introduced the subject by giving some particulars of the habits of the two groups. He related having seen a pair of Wedge-tailed Eagles chasing a hare, which sought as much shelter from a fence as it could, but was dislodged by one of the birds, while the other remained ready to capture it as it emerged from cover. He said hawks were deserving of protection from the fact that they were great enemies to snakes.

Dr. Macgillivray related a number of interesting facts about different members of the groups which had come under his notice during many years' experiences in the back country. He maintained that the Wedge-tailed Eagle rather than being a nuisance to pastoralists was a benefit, as it was very destructive to rabbits. On one occasion he found the remains of no less than two hundred rabbits round one nest, besides which there were ten freshly killed ones. His experience was that only weakly lambs were attacked. The Goshawk was very destructive to small birds, while the Sparrow-hawk preferred domestic chickens. Owls, as a rule, fed largely on insects, but the Barn Owl was very destructive to rats, mice, and the smaller marsupials. The Black-cheeked Falcon was remarkable for its determination and courage, and he had observed it feeding on the small Shell Parrakeets.

Mr. A. D. Hardy, F.L.S., considered the Goshawk one of the most destructive species, and he had known it attack magpies.

Mr. C. F. Cole related that the Harrier had proved very destructive to the White-faced Storm-Petrels at Mud Island, and also to the Ibis on inland swamps. He considered they took five or six years to attain full plumage. Whistling Eagles were extremely fond of Cormorants and Quail.

Mr. A. H. E. Mattingley, C.M.Z.S., asked why the Powerful Owl should be so scarce, but without satisfactory reply.

NATURAL HISTORY NOTE.

CATERPILLAR OF GUM EMPEROR MOTH. — Mr. J. S. Kitson stated that on 23rd March, while watching some captive larvæ of Gum Emperor Moth, *Antheraea eucalypti*, moulting, he noticed that one, shortly after casting its skin, turned round, and, while the cast skin was still moist, commenced to eat it, and did not cease eating till the whole was devoured, a proceeding which took the caterpillar a little over an hour. There was a plentiful supply of fresh eucalyptus leaves alongside the caterpillar, so that want of food could scarcely be the reason for the action, and he would like to know if any reason could be given for the occurrence.

EXHIBITS.

By Mr. J. W. Bainbridge.—Nest of wasp, built in broken glass steam-gauge pipe, showing the different cells.

By Mr. F. G. A. Barnard.—Geological specimens from Beveridge excursion; Big Hill, Wallan; and volcanic tuff from Lilydale excursion.

By Mr. J. Booth.—Stick-insect among twigs, showing protective resemblance and colouring; frogs, *Hyla lesueurii*, from Sunbury, and *Heleioporus pictus*, from Wagga, N.S.W.

By Mr. J. W. Collings.—Volcanic bomb from Beveridge excursion.

By Mr. C. F. Cole.—Specimens of falcons, hawks, kites, owls, &c., in different stages of plumage, in illustration of discussion.

By Mrs. C. H. Edmondson.—Flowers and berries from Buffalo Mountains.

By Mrs. A. D. Hardy.—Skin of Black-cheeked Falcon.

By Mr. A. D. Hardy, F.L.S.—A fresh-water alga, *Enteromorpha intestinalis*, Link. (family Ulvaceæ), from Burnley.

By Mr. J. A. Kershaw, F.E.S., on behalf of National Museum.—Specimens of rarer Victorian hawks and owls.

By Mr. D. J. Mahony, M.Sc.—A fossil watch found at St. Kilda, in illustration of paper.

By Mr. C. Oke.—Berries from Mt. Wellington, Tasmania, gathered at an elevation of over 2,500 feet.

By Miss Raff.—Nodular swellings on branch of She-oak, *Casuarina distyla*.

By Mr. W. Thorn.—Specimen of mistletoe growing on tree lucerne.

By Mr. J. Wilcox.—The rotifer, *Megalotrocha alboflavicans*, under microscope.

After the usual conversazione the meeting terminated.

EXCURSION TO BEVERIDGE.

THIS excursion took place on Saturday, 13th March, and was arranged for the purpose of visiting the extinct crater marked on maps of Victoria as Mount Bland, but locally known as Mount Fraser, after some previous owner of the property. Though the afternoon threatened to be showery, and the locality is generally considered an uninteresting one, the leader was pleased to have a following of 17 members and friends, including several ladies. Four of the party motored up from town (25 miles), and joined the others at the railway station. Mt. Bland, or Beveridge Hill, as it is also known, can be easily seen on the northern horizon from the more elevated parts of Melbourne, such as the higher parts of Carlton, and from there lies a little to the west of due north. To travellers along the Sydney road or the North-Eastern railway, it is a prominent object, especially as one descends the Dividing Range towards Wallan, and no doubt Hume and Hovell, when, after troublous times around Mt. Disappointment, in December, 1824, they crossed the Divide just about the locality of the present railway line, and saw the bold mass standing up before them, made directly for it, as it is on record that they named it Mt. Bland on the 14th December, 1824, after a Dr. Bland, of Sydney, a patron of their expedition, and took their bearings thence to Aitken's Hill, near Somerton, 10 miles further south—another interesting locality to the field worker, and the site of former excursions of this Club (*Vict. Nat.*, xviii., p. 33). Beveridge station is 989 feet above sea-level, and as the mount is little more than half a mile from the station, the gradual slope towards the summit commences almost at once. One of the members had brought an aneroid, and we were thus able to obtain a few approximate heights as we proceeded. Just where the ground seems to make a decided slope upwards on the southern side we found the height to be 1,160 feet. Thence to the lowest portion of the southern rim—in fact, except the breach, the lowest part of the rim—was a steeper ascent of 90 feet, or a total of 1,250 feet. The outlook here was extremely interesting. Fifty feet below was the floor of the crater, a perfectly level little plain, about 180 yards in diameter, while all round in almost a perfect circle rose the encircling rim, except towards the north

west, where it was broken down, and had formed the exit for the lava of former ages. On the southern side of the breach the rim rose to 1,280 feet, while on the opposite side (the northern side of the crater), it rose to its highest point, 1,380 feet above sea-level; round to the east it gradually fell to the spot from which we first viewed it. The breach itself is about 20 feet above the level of the floor. Unfortunately, we were not able to accurately measure the distance from rim to rim, but careful estimates gave it as about 450 yards. In one corner of the bottom is a water-hole for stock, excavated in the solid lava (bluestone), but, owing to the dry season, it contained little water. It is probable that in this isolated pond some interesting life might be found after a wet season. Two or three photographs were secured of interesting features, but the strong wind blowing formed a serious obstacle to successful photography. From the highest part of the rim an excellent view of the surrounding country was obtained. Though very hazy and stormy towards the south, we were able to pick out the You Yangs, 50 miles away; the Anakies, a little further; Macedon, Hanging Rock (the scene of the excursion three weeks before), 20 miles to the north-west. Due north was the Big Hill, or Pretty Sally's Hill, an outlier of the Dividing Range, with Wallan at its foot, while to the east were the Plenty Ranges, almost enshrouded in heavy masses of black clouds. Besides these more prominent mountains, numerous points of eruption occur all round, such as the Bald Hill, a little further south, Green Hill, close to Wallan, &c., details of which will be found in a paper by Mr. T. S. Hart, M.A., read before this Club some years ago (*Vict. Nat.*, xi., 74). Having taken in the surroundings sufficiently, we traversed the rim towards the west, to where, owing to the operations of rabbits, there was an exposure of tuffs and lapilli, of which nice specimens were secured. I am indebted to Mr. F. Chapman for a few notes on the geological features of the mount, &c. He says:—"The extinct volcano at Beveridge, Mount Bland, presents so many interesting features, and in several points differs from those of other neighbouring cones, that to anyone at all interested in the study of volcanic phenomena it is well worth a visit. The main rim of the cone on the south and west appears to be composed generally of scoriaceous basalt. The northern flank, however, rising 100 feet higher, is largely composed of volcanic agglomerate and lapilli of a comparatively light colour (pale ochreous to reddish-brown) and microscopically resembling true pumice, although not floating in water. This accumulation may have arisen from a later outburst, and since the cone is not quite circular in outline there may have been one or more parasitic cones produced by renewed activity of an explosive nature. Numerous volcanic bombs were seen strewn over the surface of the cone, some attaining a foot or

more in length, and varying in shape from spheroidal to fusiform nodules. One rounded bomb was found fractured, which showed the interior to be composed of several layers of scoriaceous or frothy lava of varying density, which had evidently accreted round a nucleus in successive stages. The crater lake shows the characteristic features, well preserved, and from the presence of rushes it was evident that a considerable swamp exists there during the winter months. The crater has been broken down on the western side, and the 'breaching' is most distinctly shown as a wide valley with gently curving sides, through which the lava once flowed down in a resistless stream to fill up some old creek valley, and spread over the site of where Coburg, Collingwood, and Richmond now stand. Another interesting feature—the level of the crater-floor being lower than the breached edge of the crater—points to a sagging down of the lava within the throat of the volcano during the last stages of the eruption. The basalt of this cone, besides being scoriaceous, shows numerous phenocrysts of olivine, generally of the variety rich in iron." As showing how unexpectedly one may come across interesting specimens, it may be mentioned that in passing through a wire fence on the top of the hill a specimen of that singular beetle, *Rhipidocera mystacina*, Fab., noticeable for its beautiful pectinated antennæ, was taken, and further search revealed another specimen on the wire not far away, probably sheltering from the strong wind prevailing. A descent was now made to the Sydney road, which passed round the western side of the hill. On reaching this we found the height to have dropped to 1,025 feet, showing that the mount has an elevation of about 350 feet above the plain. On the other side of the road some rocky hills attracted our attention, so, leaving the ladies to follow the road to Wallan, the others made a slight detour, and found the hills to be the remains of the rim of another crater, but much smaller and imperfect. Growing in the crevices of the basalt were numerous plants of maiden-hair fern, *Adiantum athiopicum*, just sending up new fronds after the recent rains. Hereabouts some good volcanic bombs and pieces of light scoria were picked up by those interested, and we then wended our way towards Wallan, about 3 miles distant, which we reached just as darkness set in. We found the ladies had ordered tea at the Tower Hotel, so we were all soon engaged in replenishing the energy expended during the afternoon. As the railway station is quite two miles from the township, we had a pleasant walk after tea in the brilliant starlight, and caught the 10 p.m. train for town. It is unfortunate that trains are so infrequent on the North-Eastern line, as there are several other places in that direction which would be worth visiting if it could be accomplished without so much expenditure of time.—F. G. A. BARNARD.

EXCURSION TO LILYDALE.

A COOL and pleasant afternoon on Saturday, 27th March, was partly responsible for the large number of members and friends (38) taking part in this excursion, most of whom came down by the 1.22 train from town. On arrival the party turned back up the line towards Mr. Mitchell's limestone quarry. At the entrance we were met by Mr. Mitchell, jun., who very kindly led us round the works, so that we might gain some information as to the method of producing the lime which is prepared in large quantities at Cave Hill. The quarry is an excavation on the northern side of Cave Hill, opened up nearly thirty years ago on the site of the original cave noted by Sir A. R. C. Selwyn on his map published in July, 1856. The note runs as follows:—"Limestone cave 120 feet deep.—Hard, crystalline grey and reddish limestone. Fossils, corals, &c. (Wenlock limestone?)" This cave yielded the early geological surveyors a small collection of fossils, chiefly corals, which, with its original label, "From a limestone cave in the parish of Yering," is now in the National Museum, Melbourne. We learned from Mr. Mitchell, jun., that when the cave was first opened it was hung with numerous stalactites, which must have presented a striking appearance; but, alas! the stalactites were speedily removed, and only a small portion of the original cave remains to view. In all probability there is another cave hidden away behind the quarry face, since Mr. Mitchell informed us that at one particular spot, pointed out to the members, several crowbars have been lost, having dropped into a cavity at about the angle made by floor and wall. Further indication is seen in an extensive pipe of the overlying rock, which forms a huge "swallow hole" leading into the limestone mass. The limestone in this quarry dips at a steep angle (35° – 50°). The bedding plane can be easily verified by the growth of corals, &c., such as *Favosites* and the various stromatoporoids, which may be traced along the planes of sedimentation in their relative position of growth. A large proportion of the limestone is dolomitized by the action of the overlying old volcanic rock which covers this side of the Cave Hill. The dolomitized limestone contains some iron, which renders these altered layers conspicuous by their reddish-brown colour. The opportunity was taken at this stage to point out to members the chief items of interest in regard to the quarry, one of the most important being the close relationship it bears in age—or, at any rate, its fauna—to that of Dudley and Wenlock, in England, and to that of the island of Gotland.

The fossils collected during the afternoon included—*Cyathophyllum* sp., *Favosites grandipora*, Eth. fil., *Syringopora* sp., *Heliolites* sp.; various stromatoporoids, including *Clathrodictyon* sp., *Euomphalus disjunctus*, J. Hall, *Trematonotus pritchardi*, Cresswell, *Trochus* (*Scaletrochus*) *lindstroemi*, Eth. fil., *Cyclonema*

lilydalensis, Eth. fil., and *Niso* (*Vetotuba*) *brazieri*, Eth. fil. After witnessing some blasting of the limestone, the party inspected the overlying decomposed basalt, which is seen to rest on a bed of fine angular sand, and this in turn rests unconformably on the limestone. The sand in places has been partially dissolved, probably by heated and alkaline water from the overlying basalt, and re-deposited as chalcedonic concretionary layers and nodules in the uppermost part of the sand-bed. A fine view of the Dandenong Ranges, and also of the Main Divide, was obtained from the eastern side of Cave Hill, whilst beneath our feet lay a remarkable bed of quartzite, in part conglomeratic. Crossing the paddock, and taking the road in a westerly direction, we next visited a notable example of a low tuff cone of the older volcanic. This point of eruption is in remarkably good preservation, considering its age and the material of which it is constructed. The interior of the crater is now used as a fruit and vegetable garden. The Melbourne road cuts through one side of the cone, which enabled us to see very clearly the tuffaceous material of which it is constructed—a fine reddish-brown ash with small scattered lapilli. Across the road in an adjoining paddock there is a section showing another tuff deposit, the material of which is of an ash to brown colour, and appears to be a finer material than that seen in the road cutting. The members then returned to Lilydale, and a contingent caught the early train to town. Those who remained for the later evening train were most kindly entertained to tea by one of our members, Miss Rollo, who also, earlier, placed the members under obligation by suggesting the extension of our walk to take in the interesting tuff cone, which proved so instructive an item in our programme.—F. CHAPMAN.

EARLY FLOWERING OF ACACIAS.—Looking over some back numbers of the *Naturalist* I saw a note on p. 52, vol. xxii.—“The first blossoms of the Silver Wattle, *Acacia dealbata*, were picked at Kew on 1st July, 1905. Notes of other early flowerings are desired.” I have a specimen in my possession gathered by myself, marked “*Acacia dealbata*, Healesville, June, 1906.” It is in full flower. In other seasons since then I have noticed this acacia in bloom in the same month. My recollection is that it was about the end of the second week. The earliest I have seen were at Yarra Glen early in the same month, and this in several seasons. The earlier bloomers face the north-east. I have observed that in other species this aspect brings the first blooms, and that trees planted in a curve so as to face every point of the compass give a succession of bloom from earliest to latest. Whether or not it is a coincidence, my experience is that these early bloomers are most infested with the Goat Moth, *Zeuzera eucalypti*, Boisd., particularly the cultivated *A. Baileyana*.—REG. KELLY. Mt. Yule, Healesville, 24th April, 1909.

A FOSSIL WATCH.

By D. J. MAHONY, M.Sc.

(Read before the Field Naturalists' Club of Victoria, 19th April, 1909.)

BEFORE describing the specimen, some apology should be offered for the title of this short paper, for the word fossil connotes great antiquity to most of us, and a watch, especially a keyless watch, can certainly be of no great age. Mr. J. E. Marr, in his well-known work, "The Principles of Stratigraphical Geology," remarks that the stone implement of the river gravels is as genuine a fossil as the ammonite collected from the chalk, and that even more modern implements may be true fossils. For instance, the occurrence of moa bones in New Zealand in accumulations below those containing biscuit tins and jam pots has been used as a geological argument pointing to the extinction of the moa before the arrival of Europeans. The biscuit tin here serves all the purposes of a fossil, and there is no valid reason why it should not be spoken of as such. The same argument applies to the watch under consideration for it shows that the rock in which it was imbedded has been solidified during the last quarter of a century.

The specimen consists of a watch and chain, now separate, but evidently once united. The watch is keyless, and the winder has been broken off and is still attached to the chain. The chain is of German silver, and is of the short double type worn by ladies about 15 years ago. The two strands are fastened by a sliding band and the swivel and shank are attached. The ring or bow to which the swivel is fastened is of rolled gold, and the shank which connected it and the winder to the watch has an iron core. The whole is for the most part imbedded in a hard mass of sandstone, composed of small silica grains of beach sand and some pebbles of ironstone, bound together by a cement of calcite, and in part iron-stained. The iron oxide is especially common round the steel shank of the winder, from which it has evidently been derived. There are a few slight traces of verdigris on the chain, but the exposed parts scarcely look duller than they would if put by in a drawer for a few years, and they remain quite flexible. It might well be used again if freed from stone. The watch itself was unfortunately broken away from the rock by the workmen who discovered it. Mr. Kosminsky, an expert on the subject, informs me that this kind of keyless movement is still used in Geneva watches, and was first introduced about 20 years ago, so that the age of the watch is restricted to that short number of years. The case is missing, but was probably silver. The works are of steel and brass, and the face is white enamel, quite fresh and unstained, with the figures as clear as on the day when it left the maker. The hands are broken off.

I am indebted to Mr. Chas. Robinson, the overseer in charge of the works, for the specimen. In March, 1906, a workman engaged on the improvements at Red Bluff, St. Kilda, found it while trimming away a mass of rock on the beach line at the foot of the cliff. It was situated at the mouth of a cavity cut by the sea into the cliff, which consists of a red ferruginous sandstone of cainozoic age. The sand with which it was covered was cemented by the action of the sea water, which dissolved some of the lime carbonate composing the dead shells on the beach and redeposited it amongst the sand grains. Similar rock is common in the neighbourhood. Its position, together with the fact that the case has been roughly removed, points to a burglar's "plant."

The two main points of interest about the specimen are the evidence of the quick formation of solid rock and the wonderful way in which metals have survived under conditions which seem the reverse to favourable. About the hardness of the rock it may be remarked that it required very appreciable pressure on a knife-blade to make an impression.

One of the most remarkable points about the watch is that the hair-spring is still preserved, and, though rusted in places, some parts of it look quite clean when seen with a magnifying glass. Other steel parts, such as the regulator, can be moved, and the balance-wheel is free to turn on its axis, but some parts have rusted a good deal. The brasswork is almost without chemical change, and the teeth of the cogs are as sharply defined as when the works were moving. It seems a marvellous thing that these metals should be preserved while the surrounding rock was solidified by sea water percolating between the sand grains.

This fossil brings home to one the unbroken processes of nature. In times so remote that the mind can scarcely form any adequate idea of their antiquity the rocks were forming in the same way and preserving traces of the highest forms of the life of the times—forms that have been succeeded by others of a higher type. Here is a record of nature's greatest triumph, man. It speaks of the brain that can conceive a means of measuring time and the art that can execute the necessary work, but, alas! it also tells of the thief who would destroy all for the paltry value of the silver case.

ELEMENTARY PHYSIOLOGY. — A course of twenty University Extension Lectures in Physiology, by Prof. W. A. Osborne, M.B., D.Sc., was commenced at the University on Tuesday evening, 4th May, and will be continued at weekly intervals. The cost of the course is one guinea. Further particulars can be obtained from the secretary, Mrs. W. A. Osborne, University, Carlton.

BOOK NOTICES.

DARWINISM AND THE PROBLEMS OF LIFE. By Conrad Guenther, Ph.D., &c. Translated from the third edition by Joseph M'Cabe.

LAST WORDS ON EVOLUTION. By Ernest Haeckel, translated from the second edition by Joseph M'Cabe.

WE received some time ago from the publishers, Owen and Co., London, copies of the above works, which, up to the present, have not received notice in these pages. Those who are following up the great question of evolution in its varied aspects will find statements of great value in these books, which will be helpful to them in drawing conclusions from any set of facts. The second work, on account of its illustrations, genealogical tables, &c., is perhaps more interesting than its companion, and puts the question in such an unanswerable way that the reader cannot help being convinced even against his will. It concludes with a striking manner of illustrating the duration of life on the globe, which seems worth quoting. Many leaders of science, such as geologists, palæontologists, astronomers, and physicists, have variously calculated the time which has elapsed since life first manifested itself on our earth at from one hundred to two hundred millions of years. If, for argument sake, the shorter time be taken, and an attempt made to reduce this vast period of creation to an understandable unit such as twenty-four hours, as has been done by Dr. H. Schmidt, of Jena, it will be found that the five evolutionary periods, through which most are agreed life has extended, would make up one day as follows:—

1. Archeozoic period (52 million years) = 12 hrs. 30 mins.
2. Paleozoic " (34 million years) = 8 hrs. 7 mins.
3. Mesozoic " (11 million years) = 2 hrs. 38 mins.
4. Cenozoic " (3 million years) = 43 mins.
5. Anthropozoic period (1-200,000 years) = 2 mins.

Analyzing this latter period at the same rate, it will be found that the "historic" portion extends to only *five seconds*, while *two seconds* would suffice to cover the Christian era. Such a calculation seems incredible, and yet the evidence of its correctness appears on every hand.

REMAINS OF PRE-HISTORIC MAN.

THERE have recently been unearthed in France certain remains for which are claimed the distinction of being the earliest remains of man yet found. Somewhat to the south-west of Central France are situated the departments of Corrèze, Dordogne, and Lot, where during recent years important deposits of cut flints have

been found in several places, and from the village of Moustier, situated at the foot of a chalk cliff in the upper valley of the River Vézère, has been derived the term "Moustierian," used by archæologists to indicate an age of civilization. In the same neighbourhood are the caves of the Eyzies, which are decorated with designs that go back to the reindeer age. Near the village of Chapelle-aux-Saints, in the department of Corrèze, in a cave at the depth of about two feet, were found the remains of a skull, so complete that it has been possible to reconstruct it without the necessity of the restorer supplying any missing parts. The skull was associated with chipped flints and the bones of reindeer and bisons. A fresh discovery at Moustier has thrown further light on the life of those ancient days. After finding large quantities of cut flints in a cave, the workmen unearthed some fragments of bone, which careful examination proved to be parts of a human skeleton, but though extreme care was taken many of the bones fell to dust as soon as they were exposed. However, portions of the skull and other bones were secured, from which it is surmised that the remains are those of a young man about eighteen years of age and four feet ten and a quarter inches high. From the position of the remains it seems probable that the body had received a primitive burial, for along with it were found a pointed flint dagger, remarkably well cut, and a well-formed scraper, while around were numerous bones of oxen, some of which were partly calcined. It is almost impossible to ascribe even an approximate date to this skeleton, but, judging by recent observations of denudation in Switzerland, &c., it seems permissible to reckon its age at 400,000 years. The *Illustrated London News* of 27th February gives illustrations of the skulls, &c., published by arrangement with *L'Illustration* of Paris.

THE NATIONAL PARKS ASSOCIATION.—This Association, it will be remembered, was inaugurated at a public meeting in the Melbourne Town Hall in December last. Since that time the executive, which is composed of representatives of the various scientific societies of Victoria, has been steadily gathering information as to desirable places for reservation, and, on the 5th inst., waited on the hon. the Premier with its suggestions. The deputation was most favourably received, and it is to be hoped that the important work now started will not be allowed to flag until something tangible results.

VICTORIAN EUCALYPTS. — The series of articles in *Every Saturday* on eucalypts, with special reference to Victorian species, has been continued during the month, and provides some useful notes, the brevity of which is to be regretted.

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FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 10th May, 1909.

The president, Mr. G. A. Keartland, occupied the chair, and about 70 members and visitors were present.

CORRESPONDENCE.

From Mr. D. Mahony, M.Sc., intimating that it is proposed to entertain Prof. J. W. Gregory, D.Sc., at dinner, during his approaching visit to the State, by the bodies with which he had been connected when resident in Melbourne, and asking whether the Club would take part in the welcome. It was resolved, on the motion of Messrs. Thiele and Stickland, that Mr. G. B. Pritchard, B.Sc., be appointed to act on the proposed committee.

REPORTS.

A report of the Easter dredging excursion to Western Port Bay was given by the leader, Mr. J. Gabriel, who reported a successful outing but a very poor attendance of members. The weather had been very favourable for dredging, and three different localities had been tried. Attention had been principally devoted to the Mollusca, of which 225 species had been obtained. This total exceeded that of the previous year by five species, and included 46 species not obtained then. He called attention to the more important finds, and exhibited examples of several of the more interesting species.

A report of the excursion to Altona Bay on Saturday, 24th April, was given by the leader, Mr. G. B. Pritchard, B.Sc., who reported a good attendance and an interesting afternoon's work. Some time had been spent in the examination of the shell deposits near the Williamstown Racecourse and discussing their probable origin. The party then went on to the workings at the Altona Bay Coal Company's shaft, where the geological features of the locality were explained.

The excursion for Saturday, 8th May, to see the basalt columns at Holden, had to be postponed owing to the inclement weather, and will probably be included in the list for next session.

A report of the junior excursion to Royal Park at Flemington Bridge, on Saturday, 1st May, was given by Mr. H. W. Wilson, who acted as leader owing to the unavoidable absence of Mr. J. A. Leach, M.Sc. The attendance was rather small. The afternoon

was devoted to demonstrating how a landscape is altered by weathering and cutting down by streams.

The hon. librarian acknowledges the receipt of the following donations to the library :—*Journal of Agriculture of Victoria*, January and February, 1909, from Department of Agriculture ; *The Emu*, January, 1909, from the Australasian Ornithologists' Union ; *The Microscope*, March, 1906, from Watson and Sons, Melbourne ; "Records of the Australian Museum, Sydney," vol. vii., part 3, from the Trustees ; "A Critical Revision of Genus *Eucalyptus*," part 10, and "Forest Flora of New South Wales," vol. iv., part 3, by J. H. Maiden, F.L.S., Government Botanist, from the author ; "Report of Botanic Garden and Domain, Sydney," for 1907-8, from the Director ; *Agricultural Gazette of New South Wales*, February, March, and April, 1909, from Secretary for Agriculture, Sydney ; "Proceedings Linnean Society of New South Wales," 1908, part 4, from the Society ; *The Australian Naturalist*, January, 1909, from the New South Wales Naturalists' Club ; *The Tasmanian Naturalist*, February, 1909, from the Tasmanian Field Naturalists' Club ; *Nature Notes*, November and December, 1908, and *The Selborne Magazine and Nature Notes*, January, February, March, 1909, from the Selborne Society, London.

ELECTION OF MEMBERS.

On a ballot being taken, Miss Janet Raff, B.Sc., Stanley-street, Elsternwick, was elected an ordinary member ; Miss Hilda Atkinson, 6 Kooyong Koot-road, Hawthorn, Mr. Geo. Langley, 93 Bay-street, Port Melbourne, and Mr. Chas. Stout, Gillies-street, Fairfield, as associates ; and Masters Ronald Chugg, Mont Albert-road, Canterbury, and Sidney Green, 235 Auburn-road, Hawthorn, as junior members of the Club.

GENERAL BUSINESS.

The hon. secretary reported that, as representative of the Club he had attended the deputation of the National Parks Association which had recently waited on the Premier with the resolutions adopted at the public meeting held in the Melbourne Town Hall. The association desired the reservation of land, &c., at Mallacoota and Wingen Inlets, East Gippsland ; the islands surrounding Wilson's Promontory ; a national park in the Mallee ; and the erection of simple memorials to mark the routes travelled and the landing places of the early explorers. To each of these requests the Premier expressed himself favourable, and it seemed probable that something definite would result.

Nominations were received for office-bearers for the years 1909-10, and Messrs. D. Best and J. Stickland were elected to audit the accounts for the past year.

PAPER READ.

By Mr. G. B. Pritchard, B.Sc., F.G.S., entitled "The Recent Shell-beds of Williamstown."

The author discussed the occurrence of the sandy shell-beds exposed near the Williamstown Racecourse, on the Altona Bay railway line, which have been regarded as evidence of an elevated sea-bottom, but he pointed out that the evidence of the surrounding locality showed that a gradual reclamation of the sea shore was taking place, and that the origin of the beds was no doubt wind and tide, and that they were geologically of Recent age. This was shown by the fact of their being almost entirely composed of the shells of living species. Careful examination has shown that at least one hundred species of mollusca can be collected there, besides numerous remains of crustacea, corals, polyzoa, &c.

The author's remarks were closely followed, and some little discussion followed the reading of the paper.

Owing to want of time the discussion on the Ranunculaceæ (Buttercup family) was postponed.

NATURAL HISTORY NOTE.

Mr. A. D. Hardy, F.L.S., mentioned that plants of the scarlet pea, *Kennedya prostrata*, were blooming at the present time in his garden at Kew.

Mr. F. G. A. Barnard stated that he had recently paid a visit to the Fernshaw district, and had been grieved to see the destruction caused there by the bush-fires of last summer. The beautiful vegetation along Morley's track had been utterly ruined, and would take many years to recover. He had remarked with interest the numbers of tree-ferns with from three to seven crowns from the same stem, while in one instance a *Dicksonia billardieri* and an *Alsophila australis* had grown together and formed a symmetrical trunk some five or six feet in height.

Mr. F. Pitcher mentioned that during a recent holiday in Tasmania he had been present at a meeting of the Tasmanian Field Naturalists' Club in Hobart, where he had been most cordially welcomed. The meeting was well attended, and the club appeared to be prosperous and doing good work.

Mr. A. H. E. Mattingley called attention to his exhibit of a white egg of the Emu. Mr. G. A. Keartland said that he had been informed by the late Prof. M'Coy that in such a case it was probable that if hatched out a white egg would produce an albino bird.

EXHIBITS.

By Mr. R. W. Armitage.—Blooms of Sunshine Wattle, *Acacia discolor*, from a tree which began to bloom during last week of April; bloom of *Acacia urophylla* (starting to bloom

beginning of May); spray of a variety of acacia raised from seed of Cootamundra Wattle, *Acacia baileyana*, with spray of latter for comparison; galls on *Acacia baileyana*, causing alteration of colour of leaves along whole course of twigs from greyish-white to russet-tinted; leaf of Purple Oak, *Quercus purpurea*, showing autumn colouration; spray of Portugal Evergreen Oak, *Quercus lusitanica*, with fruit; spray of Evergreen Oak, *Q. virens*, from south of Europe, with fruit. All the specimens were grown in Malvern Public Gardens.

By Mr. J. W. Audas.—*Ranunculus repens*, L., Creeping Buttercup (introduced), from Emerald, November, 1907. Only previously recorded from Outtrim, South Gippsland.

By Mr. F. G. A. Barnard.—Geological specimens from Altona Bay excursion; live specimen of *Lepisma*, sp., commonly known as "Silver-fish," which has been without food for four months.

By Mr. C. F. Cole.—A living specimen of an orthopterous insect which is responsible for the sound resembling the cry of a chicken often heard in the evening during the autumn. The sound is produced by crossing the wings.

Mr. J. Gabriel.—Shells collected during the Easter dredging excursion.

By Mr. A. D. Hardy, F.L.S.—A desmid, *Pleurotaenium mamillatum*, from the Yan Yean water. First time exhibited, though first reported in 1906.

By Mr. H. Jeffrey.—Coral growing on bivalve shell from New Hebrides.

By Mr. J. A. Kershaw.—Orchid, *Pterostylis pedaloglossa*, also specimen of the luminous fungus, *Pleurotus candescens*, collected at Snake Island, Corner Inlet, 9th May.

By Mr. J. S. Kitson.—Nest and egg of Mistletoe-bird, *Dicaeum hirundinaceum*, from Longwarry—the nest was built in a gum sapling, about 8 feet from the ground; eggs of land tortoise, found by Mr. E. Triplett at Kow Swamp, N.W. Victoria; dipterous flies parasitic on larvæ of Mottled Cup Moth (35 flies emerged from one cocoon).

By Mr. A. H. E. Mattingley, C.M.Z.S.—Three Emu eggs—(a) typical, (b) white, (c) size and shape of pear; album of views of the islands of Bass Strait, showing bird-life, &c.; specimens of topaz (known as Killiecrankie diamonds), from Mt. Killiecrankie, Flinders Island, Bass Strait.

By Mr. C. L. Plumridge.—Wasp's nest, showing larvæ and food store; also flowers of Japanese Anemone, Clematis (hybrid), and Delphinium, for illustrating discussion on Ranunculaceæ.

By Mr. P. R. H. St. John.—Specimen of Manna Gum, *Eucalyptus viminalis* (juvenile or sucker form), showing variegated leaves, from Caulfield district, 24th April last.

After the usual conversazione the meeting terminated.

EXCURSION TO STONY POINT, WESTERN PORT.

ON our programme of excursions for 1908-9 the Easter excursion was put down for Hastings, but it was decided to alter it to Stony Point, where we had done so well the previous Easter, as it affords better opportunities for good work.

Before noon on Good Friday, 9th April, our small party of three was heartily welcomed by Mr. and Mrs. Osterlund, our hosts of the previous year, and after a hasty dinner no time was lost in getting to the dredging ground. Having been so successful with the Mollusca last year, we decided to again work over some of the same ground, and were soon enthusiastically engaged in picking out the treasures from our hauls. We were fortunate in striking the *Modiola* ground again, but, although we worked over it several times, obtained only one species, *Modiola albicosta*. However, we kept on till dark, and returned home well satisfied with the afternoon's work.

Saturday morning was ushered in with slight showers of rain, which proved, however, to be only the "pride of the morning." The tide being out, we spent two hours on the rocks hunting for littoral species, with fair success. A little before noon we started off in the launch again, selecting for this trip some new ground. Starting opposite Sandstone Island, we dredged northerly with the tide for three or four hours, until, rounding French Island, we were opposite Quail Island. The results, however, were so meagre that we decided to try on the Hastings side of the channel, where we found marine life more prolific. Molluscs, polyzoa, sea-pens, &c., were in profusion, and, after selecting what we wanted, a pleasant run home of eight or nine miles wound up an excellent day for the delighted three.

On the third day we made an early start in a southerly direction. Starting off Tortoise Head, we dredged with the tide towards Rhyll, with excellent results. In this locality are found the rare *Typhis yatesi*, *Conus segravei*, *Humphreyia strangei*, *Clavigella multangularis*, and the extremely rare shells *Modiola arborescens* and *M. victorie*. Opposite Rhyll, towards Elizabeth Island, was our next ground; here we were successful in getting six fine specimens of the *Typhis*, or, as our skipper called them, "Cows' Horns," on account of the two peculiar spiny processes which project and curve outwards very like cows' horns. It is very rarely that this shell is found with the processes intact, consequently we were very pleased that four of them were in perfect order. There still being a few hours left, we returned to Tortoise Head, and cast a few dredges in Gardiner's Channel, but the tide was slack, and we were unable to work the dredge properly, so we made homewards again, well pleased with the day's results.

During the three trips we secured 225 species of Molluscs,

of which 180 were Gastropods and 45 Lamellibranchs, our total being five more than the record of the previous trip. While naturally not getting all the species we got before, we added 46 species to our previous list, which is given in full in the *Naturalist* for July last (vol. xxv., p. 54); of these 37 were Gastropods and 9 Lamellibranchs. Thus our two years' dredging has resulted in a list of 266 species, and there are still many more to be got.

Among the shells obtained was our smallest Victorian univalve, named by our fellow-member, Mr. J. H. Gatliff, *Cyclostrema bastowi*. This shell is extremely minute, measuring only nine-tenths of a millimetre in diameter. Some fine specimens of *Conus segravei*--first figured and described in our journal some years ago (*Vict. Nat.*, vii. (1890), p. 179)—*Lippistes blainvillanus*, *Cancellaria purpuriformis*, and *Mitra vincentiana* were also secured.

An interesting find was a small chiton, *Lepidopleurus cancellatus*, Sowerby, which has a very wide distribution, being recorded from Spain, Greenland, Britain, Alaska, and Corea.

In addition to the Mollusca, numerous interesting forms of life were collected for future investigation, but unfortunately, owing to the absence of sufficient co-workers, large quantities of material such as crustaceans, sponges, echinoids, tunicates, &c., had to be thrown overboard again. Doubtless many of these have not yet been recorded for Victoria, and some may even have been new to science. It is greatly to be regretted that more of our members do not take advantage of a trip like this, which can be carried out with practically no discomfort. Everyone who stays away makes it harder for the faithful few who take part in the outing. The motor-launch is a commodious boat, and can take twenty or thirty passengers with comfort and safety, and, not being at the mercy of sails or oars, can be taken anywhere without trouble to anyone. As for material, there is sufficient for all. While our National Museum is craving so much for new material it is a pity to see it lost for want of gatherers.

A small species of Hermit Crab was another interesting find. This creature selects for its home a cylindrical hole in a stone, preferably sandstone. When it retires into this hole it so arranges its four front claws that they appear like a circular cap or lid, and completely close the entrance. A most wonderful and ingenious plan, and a beautiful protection to itself.

While on the water we noted the following birds:—

Numenius cyanopus	...	Curlew
Tringoides hypoleucus	...	Common Sandpiper
Larus novæ-hollandiæ	...	Silver Gull
Gabianus pacificus	...	Pacific Gull
Sterna bergii	...	Crested Tern

<i>Notophoxyx novæ-hollandiæ</i>	...	White-fronted Heron
<i>Phalacrocorax hypoleucus</i>	...	Pied Cormorant
<i>Phalacrocorax leucogaster</i>	...	White-breasted Cormorant
<i>Sula serrator</i>	...	Gannet
<i>Pelecanus conspicillatus</i>	...	Pelican
<i>Podicipes novæ-hollandiæ</i>	...	Black-throated Grebe
<i>Eudyptula minor</i>	...	Little Penguin
<i>Chenopsis atrata</i>	...	Black Swan
<i>Anas superciliosa</i>	...	Black Duck
<i>Nettion gibberifrons</i>	...	Grey Teal
<i>Biziura lobata</i>	...	Musk Duck

A patch of scrub covering a few acres immediately behind the Stony Point station was quite alive with birds, in direct contrast to our experience of the previous Easter, when the whole country was dried up and bird-life practically absent. Here we noted the following species:—

<i>Collyriocincla harmonica</i>	...	Grey Shrike-Thrush
<i>Microeca fascinans</i>	...	Brown Flycatcher
<i>Gymnorhina leuconota</i>	...	White-backed Magpie
<i>Cracticus destructor</i>	...	Butcher-Bird
<i>Acanthiza chrysorrhoa</i>	...	Yellow-rumped Tit
<i>Zosterops cœrulescens</i>	...	White-eye
<i>Ptilotis leucotis</i>	...	White-eared Honey-eater
<i>Ptilotis penicillata</i>	...	White-plumed Honey-eater
<i>Manorhina garrula</i>	...	Noisy Minah

The following are the additional Mollusca recorded for the trip, which have been identified by Mr. C. J. Gabriel:—

GASTROPODA.

<i>Personella eburneus</i> , <i>Rve.</i>	<i>C. mayii</i> , <i>Tate</i>
<i>Siphonalia dilatata</i> , <i>Q. and G.</i>	<i>C. contabulatum</i> , <i>Tate</i>
<i>Nassa rufocincta</i> , <i>Ad.</i>	<i>C. bastowi</i> , <i>Gatliff</i>
<i>Voluta papillosa</i> , <i>Swain.</i>	<i>Rissoa petterdi</i> , <i>Braz.</i>
<i>Marginella simsoni</i> , <i>Tate and May</i>	<i>R. atropurpurea</i> , <i>Dunk.</i>
<i>Ancilla edithæ</i> , <i>P. and G.</i>	<i>R. perexigua</i> , <i>Tate and May</i>
<i>Columbella cominellæformis</i> , <i>Tate</i>	<i>R. atkinsoni</i> , <i>T.-Wds.</i>
<i>Crepidula immersa</i> , <i>Ang.</i>	<i>R. nitens</i> , <i>Dunk.</i>
<i>Vermicularia flava</i> , <i>Verco</i>	<i>Rissopsis maccoyi</i> , <i>T.-Wds.</i>
<i>Vermetus novæ-hollandiæ</i> , <i>Rousseau</i>	<i>Calliostoma incertum</i> , <i>Rve.</i>
<i>Turbonilla spina</i> , <i>C. and F.</i>	<i>Fissurella omicron</i> , <i>C. and F.</i>
<i>Odostomia simplex</i> , <i>Ang.</i>	<i>Cocculina tasmanica</i> , <i>Pils.</i>
<i>Oscilla ligata</i> , <i>Ang.</i>	<i>Chiton calliozona</i> , <i>Pils.</i>
<i>Cerithiopsis angasi</i> , <i>Semper</i>	<i>Ischnochiton sculptus</i> , <i>Sow.</i>
<i>C. turbonilloides</i> , <i>T.-Wds.</i>	<i>I. pura</i> , <i>Sykes</i>
<i>Seila attenuata</i> , <i>Hedley</i>	<i>Lepidopleurus cancellatus</i> , <i>Sow.</i>
<i>Triphora angasi</i> , <i>C. and F.</i>	<i>Tornatina brenchleyi</i> , <i>Ang.</i>
<i>Liotia australis</i> , <i>Kiener</i>	<i>Assiminea brazieri</i> , <i>T.-Wds.</i>
<i>Cyclostrema johnstoni</i> , <i>Bedd.</i>	

LAMELLIBRANCHIATA.

Myodora albida, *T.-Wds.*
Anatina creccina, *Rve.*
Mactra jacksoniensis, *E. A. Smith*
Gari zonalis, *Lam.*
Chione peronii, *Lam.*

Montacuta semiradiata, *Tate*
Mylitta tasmanica, *T.-Wds*
Lissarca rhomboidalis, *Verco*
Limopsis tenisoni, *T.-Wds.*

—J. GABRIEL.

EXCURSION TO WILLIAMSTOWN AND ALTONA BAY.

A FAIR number of members met at Flinders-street station on Saturday, 24th April, and proceeded by train to North Williamstown, where, on gathering together, we found our party numbered 18, and comfortably filled the drag which was in waiting to convey us to our destination. The Kororoit Creek road, along which we proceeded as far as the Williamstown Racecourse, is somewhat uninteresting, and the innovation of driving instead of walking the distance, some two and a half miles, was voted a great improvement. Here we halted and examined the newer basalt and marine shell-beds of the locality, and discussed their probable origin. However, there is no necessity to enter into details here, as I am dealing fully with the question in a separate paper. Members were able, however to secure specimens for after examination. We then drove on some two or three miles to the Altona Bay estate, and viewed the location of the sand-pits, the basalt quarry, and the new brick shaft of the Altona Bay Coal Company. This shaft is thirteen feet in diameter, and is being put down by a new company to test the value of the large deposit of brown coal which has been proved to exist beneath the basalt of this area. Underneath the basalt, which varies from about 25 to 60 feet in thickness, several feet of fossiliferous clays of Balcombian or Eocene age intervene before the brown coal occurs. Good specimens of fossils from this formation, excavated when sinking a previous shaft, were also secured. As the work advances it will be advantageous to again visit the locality. We then drove back to North Williamstown, having spent a pleasant, and I think profitable, afternoon.—G. B. PRITCHARD.

THE RECENT SHELL-BEDS OF WILLIAMSTOWN.

By G. B. PRITCHARD, B.Sc., F.G.S.

(Read before the Field Naturalists' Club of Victoria, 10th May, 1909.)

IN order to reach the beds in question it is best to go by rail to the North Williamstown railway station and proceed westerly past the Rifle Ranges to the neighbourhood of the Williamstown Racecourse. Upon reaching the Racecourse station, adjoining the Kororoit Creek, it will be noticed that the railway line is continued for some distance further, and this represents the remnant of the old Altona Bay line.

The Kororoit Creek has a shallow course, which meanders

along a slight depression in the surface of the newer basalt of the plains, and may be crossed by the railway bridge or road bridge, or often for the greater part of the year by a natural basaltic ford. If the railway line be followed for a very short distance from the creek two small cuttings will be seen, the first through basalt, with its typical black clay soil, whilst the second displays a good section of the sandy shell-beds. This section is about two and a half miles from the North Williamstown station and about a quarter of a mile from the present shore line.

This spot serves well to show how fossils may be preserved, and a little study of the conditions will well repay those who investigate them. At first sight the shell-beds appear to show horizontal layers, but a closer inspection shows false bedding to be distinctly present. In some parts the beds are largely composed of layers of fine, loose sand, with varying quantities of shells, whilst other layers are almost entirely shells. The porosity of those sandy, calcareous beds is well shown by the hardening of certain layers by the deposition of a limy cement, and the consolidation towards the surface, with the development of a travertine, shows the part which evaporation has played in the changes through which these beds have passed. By careful collecting a large series of fossils may be obtained from this section, including something upwards of a hundred different species of Mollusca, apart from remains of Crustacea, Polyzoa, Corals, Echinoids, and Foraminifera.

An examination of these various specimens proves them beyond doubt to be all living species, and the age of the deposit can, therefore, only be considered as geologically recent. Although many of the shells retain their colour markings distinctly enough, one cannot help being struck by the fact that a considerable number show a bleached and corroded appearance, but this is not to be wondered at when it is understood that these very shells have contributed to the calcareous cement now noted through the beds. With regard to the organic remains, there is no hesitation in saying that they are marine, but occasionally a layer of brackish water shells, composed of such genera as *Truncatella*, *Coxiella*, *Assimineia*, *Salinator*, and *Ophicardelus*, make their appearance, and for such alternations we must be able to account in a reasonable manner.

It is generally known that the basalt of the plains has a gradual slope seawards, and that the lava flow actually runs out for a considerable distance below the present sea level, but the reason for this is perhaps not so well understood. The evidence, which can be gathered readily enough, shows that the lava must have been a terrestrial flow, and, consequently, its present position can only be explained by a general subsidence, which, without doubt, followed as a natural sequence to the volcanic outpourings. The basalt has suffered very considerably by marine erosion, especially as there has been an abundance of grit derived

from the sandy tertiary deposits with which to wear down all resistance.

Along the present shore margin of the basaltic plain the accumulation of the shelly deposits has taken place, and the height above ordinary high water mark attained in the section under inspection has been determined by Messrs. A. Brown and H. Summers to be $7\frac{1}{2}$ feet.*

Such an accumulation would be commonly called a "raised beach," and the reasoning usually associated with it would be—A deposit of marine shells, therefore laid down beneath the sea; at present some 7 or 8 feet above sea level, therefore at least 10 feet of elevation; marine shells all of living species, therefore recent elevation to that extent.

Thus it has become generally accepted that there is much evidence around Port Phillip of a considerable elevation during recent time.

In 1854 † Mr. Selwyn remarks :—"Recently Upheaved Sea and Estuary Beds, containing Shells of Existing Genera and Species.—Wherever cliffs occur along the line of coast from Melbourne to Point Nepean, these beds may be distinctly seen resting indifferently on either the granite, basalt, palæozoic, or tertiary strata, also forming all the low shores where no other rocks are seen in place. They consist chiefly of beds of loose sand and clay, with layers of shells (oysters, mussels, periwinkles, cockles, limpets, and other shells, perfectly identical with those now found living on adjacent shores), but in several places from 100 to 300 feet above the level of the sea, and from 5 to 6 miles inland."

In a later report (1856) ‡ similar views are expressed, though the raised beaches are spoken of as Pleistocene.

If the geological literature of Port Phillip be followed up through later dates the general acceptance of these views can be readily noted, yet we are fully at liberty to pause and think, and inquire into their validity.

In the first place there seems to be little doubt that many of the beds now accepted as aboriginal accumulations or old kitchen-middens were included in most of the references to raised beaches. Amongst these may be mentioned some well-known spots along the eastern shores of Port Phillip, such as Point Ormond, Hampton, Half-Moon Bay, and Frankston. These deposits are notable for the number of large oysters, *Ostrea angasi*, and mussels, *Mytilus planulatus*, and other edible bivalves,

* Proc. Roy. Soc. Vic., 1902, vol. xv., N.S., part I, p. 37.

† "Geological Surveyor's Report on the Geology, Palæontology, and Mineralogy of the Country situated between Melbourne, Western Port Bay, Cape Schanck, and Point Nepean," by A. R. C. Selwyn, p. 4.

‡ "On the Geological Structure of the Colony of Victoria, &c.," by A. R. C. Selwyn, pp. 6, 7.

as well as many edible univalves; and the way in which the shells are chipped and broken is characteristic of aboriginal work, apart from the association of charcoal and the stones with which the shell-chipping was done. All these beds are well above high tide mark, though not beyond the reach of exceptional storms, and through wind agency many of the lighter shells have been redistributed and carried up gradual slopes for considerable distances. This secondary dispersal of some of these shells may account for some of the misconceptions that have arisen, and some of the greater heights that have been mentioned may possibly be accounted for in this manner. No great antiquity can be allowed here, and geologically "Recent" is all that can be said.

In the second place there are the undoubted marine deposits underlying the West Melbourne Swamp area and the Carrum Swamp area, and concerning these it will be well to again quote what Mr. Selwyn says of the area extending east from Port Phillip Bay to the base of Strzelecki's Range:—"Many parts of this area are, I believe, still beneath the sea level, the water having been excluded from them by the successive terraces or beaches of sand, which have been piled up by the combined action of wind and waves, and now form the narrow sandy belt dividing the Carrum Swamp from the sea, known as the Nine-mile Beach. A depression of 15 or 20 feet would be sufficient again to submerge the whole of the above area, and to connect the waters of Port Phillip and Western Port, as was undoubtedly the case during some portion of the Pleistocene period." According to observations made by Mr. A. H. S. Lucas* on the Coode Canal excavations, the marine silt with abundant shells is about 7 feet in thickness, and is overlaid by $16\frac{1}{2}$ feet of sands, while the ground surface is $7\frac{1}{2}$ feet above low water level. This would only bring the base of the marine silt to 16 feet and the top of the deposit to 9 feet below present low water—a position which it is quite reasonable to assume would be requisite for such a formation.

In the northern extension of these beds at Arden-street, North Melbourne, the association of *Diprotodon* remains of drift origin have already been recorded,† and quoted as evidence for regarding these beds as of Pleistocene age. This is quite in agreement with Mr. Selwyn's remarks, and we are thus able not only to mark down specifically the geological age of these marine silts, but by the evidence of their present position it is possible to very materially discount the views concerning recent elevation of other shell-beds.

In the third place, then, we may consider such accumulations

* Proc. Roy. Soc. Vic., vol. xxiii., p. 166, 1887.

† Proc. Roy. Soc. Vic., vol. xii., N.S., part I, pp. 112-114, 1899.

as the shell-beds near the Williamstown racecourse, and see what explanations can be offered that may still be in reasonable agreement with the foregoing remarks. Let us take up a position for observations from the grassy bank just above the present beach and look seawards. Even at high tide, with only a crescentic strip of sandy beach a few feet in width below us, the shallowness of the water off this shore can be noticed, but at low tide a very much finer impression can be obtained, and the development of a sand-bank running parallel with the coast is at once seen. There are times when a strong north wind keeps the tide back from properly rising over the sand-bank even at its present height, and it does not therefore require a very great stretch of the imagination to understand the conditions which would ultimately raise the bank to such a level that the high tide would no longer be able to surmount it. Inside the bank there would be a salt-water lagoon, with its collection of dead and living shell-fish and other organisms. This, when once beyond the reach of fresh accessions of sea water, must necessarily gradually soak away or evaporate, and the depression gradually becomes shallower by layer after layer of wind-blown sand. Rain water soon dilutes the saltiness to brackishness, and brings about the conditions suitable for the molluscan genera found in such regions, and enables us to account for the occasional layers of such remains in similar sands to the marine shells. Then plants of the dwarf pig-face type and others capable of existing under salty-soil conditions gradually make their appearance and contribute their share towards the permanent infilling of the lagoon depressions. The old beach slowly becomes sweetened by the continual percolation of rain water, and ultimately supports some of the coarser sand-binding grasses. A perfect sequence of such events as these can be seen if we look towards the Williamstown Racecourse, and a series of grassy and parallel crescentic tracks one behind the other marking the successive sandy beaches can be traced right up to the railway cutting already described. Here, then, there appears to be no necessity to call in elevation of the sea bottom to our aid, except such elevation as would be due to the building up of an extensive accumulation of several feet in thickness on a shallow shelving shore-line by the joint action of wind and tide.

This reclaiming process is still going on, and along this part of our coast the sea is being slowly pushed back. Such deposits are evidently Recent. The upper 16 feet or so of sands overlying the Pleistocene marine silts of the West Melbourne Swamp area should be regarded as contemporaneous with the Williamstown shell-beds.

Up to the present there is no evidence for ascribing any of the local aboriginal feeding-grounds to a high antiquity, and they also must be referred to as Recent.

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FIELD NATURALISTS' CLUB OF VICTORIA.

THE twenty-ninth annual meeting of the Club was held at the Royal Society's Hall on Monday evening, 14th June, 1909.

The president, Mr. G. A. Keartland, occupied the chair, and about 75 members and visitors were present.

REPORTS.

A report of the excursion to Coburg on Saturday, 22nd May, was given by the leader, Mr. J. A. Leach, M.Sc., who reported a fair attendance of members, and an interesting afternoon spent in examining the physiography of the locality and studying the evidences of denudation on a miniature scale for which it is noted.

A report of the visit to the National Herbarium on Saturday, 12th June, was given by Mr. J. R. Tovey, who kindly acted as leader in the unavoidable absence of Prof. Ewart. He gave some account of the progress of the institution since the previous visit of the Club, and called attention to the many valuable additions made to the library, which is now one of the best botanical libraries in the Southern Hemisphere.

A report of the meeting of junior members at the Club rooms on Saturday, 5th June, was given by Mr. A. D. Hardy, F.L.S., who took charge of the gathering, and, with the assistance of Miss F. Bage, M.Sc., and Mr. F. Chapman, A.L.S., kept the juniors fully interested in the wonders of nature under the microscope.

ELECTION OF MEMBERS.

On a ballot being taken, Miss M. Davis, 337 Weston-street, Brunswick, Mrs. W. White, Savings Bank, Malvern, Mr. E. Hill, 16 Vale-street, East Melbourne, Mr. E. A. Plumridge, 76 Regent-street, North Richmond, and Mr. J. Robinson, 138 Powlett-street, East Melbourne, were duly elected ordinary members; and Master G. A. Forster, Wrixon-street, Kew, and Masters Frank and Tom Mower, 15 Albion-street, Essendon, as junior members of the Club.

GENERAL BUSINESS.

Mr. A. H. E. Mattingley, C.M.Z.S., called attention to the recently issued list of Victorian birds compiled by Mr. J. A. Leach, M.Sc., and published by the Education Department, and moved that a letter of thanks be sent to the Director for providing so useful a list at such a trifling cost.

ANNUAL REPORT.

The hon. secretary, Mr. F. G. A. Barnard, read the twenty-ninth annual report, for the year 1908-9, which was as follows:—

“TO THE MEMBERS OF THE FIELD NATURALISTS’ CLUB OF VICTORIA.

“Ladies and Gentlemen,—Your committee have much pleasure in presenting for your consideration the twenty-ninth annual report of the work of the Club, being for the year ending 30th April last.

“During the year 84 new members were elected, consisting of 33 ordinary, 4 country, 1 associate, and 46 junior members. The total membership now amounts to 313, and is made up as follows:—7 honorary, 2 life, 157 ordinary, 54 country, 17 associate, and 81 junior members. The total is slightly larger than last year, owing to an increase in the number of junior members, but the country and associate members show a slight falling off. It is hoped that a scheme will be devised shortly by which the interest of the juniors will be brought more in touch with the general working of the Club.

“It is with deep regret we record the death of Mr. F. C. Christy, M.I.C.E., one of the few remaining original members of the Club. Though unknown to the later members, in the Club’s earlier days Mr. Christy was an enthusiast, and contributed on several occasions to its proceedings.

“The attendance at the monthly meetings has been fully maintained during the year, and it has often been felt that a larger, or, at any rate, more accessible, room for meetings would be desirable, but owing to the greatly increased cost which would be entailed by meeting elsewhere the question has always been put aside as impracticable.

“The papers read, though much fewer in number than usual, have been of great interest, while in addition three illustrated lectures were given, and for two evenings discussions on ornithological subjects were put down on the notice paper, which proved a welcome innovation.

“Twelve papers were read, of which 4 dealt with zoological subjects (2 being ornithological and 2 entomological), 3 with botany, 1 with geology, and 2 with extended trips—all of which have been published in the *Naturalist*.

“The authors were Messrs. J. W. Andas, T. Carter, M.B.O.U.; Prof. Ewart, D.Sc.; A. D. Hardy, F.L.S.; E. Jarvis, D. Mahony, B.Sc.; J. H. Maiden, F.L.S.; A. J. North, C.M.Z.S.; C. S. Sutton, M.B.; and G. A. Waterhouse, B.Sc., F.E.S. Some of these names are new as contributors of papers, and we thank them for coming forward and helping in the work of the Club.

“In addition to the papers, three illustrated lectures were given, for which the members are indebted to Dr. Hall and Mr. J. H. Harvey, A.R.I.V.A. (conjointly); Mr. F. Chapman, A.L.S.; and again to Dr. Hall.

"Your committee would urge upon members the importance of supporting this portion of the Club's work by contributions to its proceedings, the after publication of which, through the medium of the *Naturalist*, reaches a large circle of students throughout the world.

"The natural history notes read at the monthly meetings have frequently proved of great value, and in some cases provoked discussion of an interesting character. During the year many unique specimens have been exhibited, and your committee would urge upon all members the desirability of contributing to this, which is not the least interesting part of our monthly meetings.

"After an interval of three years a general conversazione and exhibition of wild-flowers was held in the Masonic Hall, Collins-street, on 22nd and 23rd September last, when the Club was honoured by the presence of His Excellency Sir T. Gibson-Carmichael and Lady Carmichael. His Excellency evinced great interest in the exhibition, and kindly opened the proceedings. The exhibits were of the usual interesting character, and their preparation and display had cost the owners many precious hours of work. The exhibition of wild-flowers was very fine, and the Club is particularly indebted to those friends in the country to whose efforts its success was greatly due. The financial result was hardly so good as on some previous occasions, but the monetary result of such an exhibition has no relation to its educational value, which, we believe, was of a high standard.

"The programmes of excursions for seniors and juniors, drawn up at the beginning of the year, have been duly carried out, and on the whole have been well attended. The choice of interesting localities close to Melbourne is becoming more limited every year, so that on several occasions members made rather long trips into the country, and with very gratifying attendances. It may be pointed out that the carrying out of an excursion programme is a very difficult matter, as so much depends upon the weather and season, and it is only fair that those members who give their services as leaders should receive that support which their action warrants. The Club is indebted to several of the leaders for interesting detailed reports of the excursions which, having been published in the *Naturalist*, are available as foundations for future excursions to the same localities. The excursions afford splendid opportunities, to new members especially, of becoming acquainted with convenient collecting grounds, and, while being of a health-giving nature, are excellent means for members to become acquainted with one another.

"The twenty-fifth volume of the Club's journal has been completed and issued to members, &c. That it is in demand as an

exchange from all parts of the world shows that it is appreciated as a record of natural history work in Victoria. The frequent inclusion of valuable illustrations, which are greatly marred by folding for the post, has induced your committee to arrange for the journal to be sent flat through the post in future, and it is thus hoped that the number will make a more presentable volume when bound. Three notable illustrations in the volume were the first published (February, 1909) plates of the nest and eggs of Newton's and the Tooth-billed Bower-birds, the long-looked-for desiderata of Australian oologists. A fair number of back numbers have been disposed of during the year, and the stock of some volumes is now extremely low.

"The Hawthorn and Camberwell Microscopical Society forwarded a communication asking that it might be affiliated with the Club, and after some consideration the requisite additional rules for the affiliation of kindred societies were drafted and adopted at a general meeting in November last, but up to the present the Society has not taken any further step in the matter.

"The Plant Names sub-committee, since its appointment in August, 1907, has held eight meetings, and has provisionally adopted more than 450 names. In order to obtain uniformity in the naming, it has been in communication with the Government Botanists of the various States, several of whom are in sympathy with its objects, and it expects to have, in particular, the valuable co-operation of Mr. J. H. Maiden, F.L.S. Although much success did not result from the first attempt to glean material from the schools, other efforts will be made in that direction, and much information is also expected when the copies of the recording census, compiled by Prof. Ewart, and issued at the beginning of the year, are returned to the Herbarium.

"During the year the Royal Society of Victoria initiated a fund to provide a medal in commemoration of the late Dr. A. W. Howitt, C.M.G., a former honorary member of this Club, and your committee forwarded a donation of two guineas to the fund as some recognition of the high place which Dr. Howitt held among the nature students of Australia.

"The recent foundation in Melbourne of a society devoted solely to microscopy in its various branches has to be recorded. The society will doubtless do much to advance that method of studying the wonders of nature, and, we trust, will have a useful career.

"With reference to matters of more public interest your committee are pleased to report a further step in the reservation of Wilson's Promontory, for which this Club has so long been working, in the appointment of a ranger, but it is greatly to be regretted that the intention of erecting a vermin-proof boundary fence has not yet been carried out. The set of lantern slides of the

Promontory possessed by the Club has been used on two or three occasions during the year before different audiences, and has served to illustrate the scenery of a portion of the State which, as years go by, will doubtless become more familiar to Victorians.

"A deputation (on which this Club was represented) waited on the Prime Minister with reference to the enormous destruction of birds for the sake of their plumage for decorative purposes, and, we are pleased to say, with good results, as it was promised that steps would be taken to minimise the evil.

"At the instance of the Melbourne Beefsteak Club your committee sent delegates to a meeting of kindred bodies, &c., which resulted in the formation of a National Parks Association, which has undertaken the duty of urging upon the Government the reservation of suitable areas for national parks, and the protection of the indigenous fauna and flora, and it is confidently expected that something tangible will result from this movement.

"Other matters of public interest, such as the pollution of Britannia Creek and the prevention of fires in the Gembrook Reserve, have occupied the attention of your committee, and an attempt was made to influence the Government to repurchase the Grange property and restore it to the Domain, but without success.

"The hon. librarian reports that during the year 61 vols. or parts were purchased, and 125 vols. or parts donated or received in exchange. Among the donations may be mentioned a copy of that valuable work, Buller's "Birds of New Zealand," presented by the University Library; several volumes of the Smithsonian Reports and Proceedings of the United States National Museum, from the National Museum; and many back numbers of the *Naturalist* from the National Herbarium. These latter have been most useful in enabling broken sets to be completed. He suggests that the Club's exchange list be further extended, and that popular works relating to natural science should be purchased for the library for the benefit of those members who have neither time nor opportunity to specialise. A large book-case was added during the year, and to Mrs. E. Bage, one of its life members, the Club is indebted for a donation towards the purchase of a case, &c., for a card catalogue, the compilation of which has almost been completed, and it is hoped that, more especially for the benefit of our country members, the catalogue will also be published in pamphlet form during the year. During the year a large number of parts of serials have been bound and made available for issue.

"The financial position of the Club is, we are pleased to say, very satisfactory. The statement of accounts to be submitted herewith shows the receipts to have been £203 8s. 9d., and the

expenditure £207 12s. 1d. The credit balance, £109 17s. 3d., is slightly less than at the commencement of the year, but as £35 has been spent on binding, and an additional bookcase, the result cannot be considered otherwise than satisfactory.

"Towards the end of the year your committee received the resignation of Mr. W. H. A. Roger as hon. assistant secretary and librarian, which was accepted with regret. During the three years Mr. Roger had held the office he had devoted a large amount of time to the duties, and your committee desire, on behalf of the Club, to tender thanks to him for the work done—work which was not very evident to the ordinary member.

"Finally, your committee would once more urge on members the desirability of inducing as many persons as possible interested in Natural History to join our ranks and so strengthen the Club, and by so doing help one another in elucidating the mysteries of nature.

"On behalf of the committee,

"G. A. KEARTLAND, *President*.

"F. G. A. BARNARD, *Hon. Secretary*.

"Melbourne, 31st May, 1909."

The report was adopted on the motion of Messrs. J. H. Harvey and J. H. Gatliff, who congratulated the committee on the work accomplished during the year.

FINANCIAL STATEMENT.

The hon. treasurer, Mr. G. Coghill, read the financial statement for 1908-9, which was as follows:—

RECEIPTS.			
To Balance, 30th April, 1908	...	...	£114 0 7
„ Subscriptions—			
Ordinary Members	£124	15 0	
Country Members ...	25	10 0	
Associates ...	2	10 0	
Juniors ...	3	14 0	
	— £156 9 0*		
„ <i>Victorian Naturalist</i> —			
Subscriptions and			
Sales ...	6	9 10	
Advertisements ...	6	15 0	
Reprints ...	5	8 0	
	— 18 12 10		
„ Conversazione Admissions ...	...	23 12 6	
„ Donation to Library (Mrs. Bage) ...	...	1 1 0	
„ Sales of Badges ...	...	0 4 0	
„ Sales of Howitt Photographs ...	...	0 8 5	
„ Interest ...	...	3 1 0	
	— 203 8 9		
	£317 9 4		

*Subscriptions:—Arrears, £28 16s. 6d.; 1908-9, £121 17s. 6d.; 1909-10, £5 15s.—total £156 9s.

EXPENDITURE.

By <i>Victorian Naturalist</i> —			
Printing ...	...	£82	12 6
Illustrating ...	...	8	9 2
Free Reprints ...	...	4	3 0
Reprints ...	...	7	0 0
		—————	£102 4 8
„ <i>Victorian Naturalist</i> —Wrapping and			
Posting ...	...	12	1 4
„ Rooms—Rent and Attendance	...	8	10 0
„ Library—Books ...	1 1 0		
Periodicals ...	0 12 6		
Binding ...	12 4 6		
Bookcase ...	22 17 6		
Card Catalogue	2 1 6		
Insurance, &c.	1 7 0		
	—————	40	4 0
„ Conversazione—Rent Masonic			
Hall ...	11 3 0		
Sundries ...	16 1 0		
	—————	27	4 0
„ Howitt photos.—Printing ...	...	0	10 0
„ Howitt memorial—Donation	...	2	2 0
„ Slides—Wilson's Promontory	...	0	6 0
„ Printing and Stationery ...	...	7	4 0
„ Postages, &c. ...	...	7	6 1
		—————	£207 12 1
„ Balance Melbourne Savings Bank	...	105	18 3
„ „ London Bank	...	3	19 0
		—————	109 17 3
		—————	£317 9 4

G. COGHILL, *Hon. Treasurer.*
15th May, 1909.

Audited and found correct.

18th May, 1909.

D. BEST,
J. STICKLAND, } *Auditors.*

The following statement of assets and liabilities was also read :—

ASSETS.

Balance in Banks ...	£109	17	3
Arrears of Subscriptions (£107), say ...	43	0	0
„ for Reprints ...	4	4	0
Library and Furniture (Insurance Value) ...	130	0	0
	<hr/> £287 1 3		

LIABILITIES.

Subscriptions to Club and <i>Naturalist</i> paid in advance ...	£6	19	0
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The financial statement was received and adopted on motion of Messrs. Best and Ewart.

ELECTION OF OFFICE-BEARERS FOR 1909-10.

The following office-bearers, being the only nominations received, were declared elected:—Professor A. J. Ewart, D.Sc., Ph.D.; vice-presidents, Mr. J. A. Leach, M.Sc., and Mr. F. Wisewould; hon. treasurer, Mr. G. Coghill; hon. librarian, Mr. A. D. Hardy, F.L.S.; hon. secretary, Mr. F. G. A. Barnard; hon. assistant secretary and assistant librarian, Mr. R. W. Armitage; and hon. editor, Mr. F. G. A. Barnard. On a ballot being taken for five members of committee, Messrs. J. Gabriel, G. A. Keartland, J. A. Kershaw, F.E.S., F. Pitcher, and Dr. C. S. Sutton were duly elected.

Mr. G. A. Keartland thanked the members for their support and encouragement during the two years he had occupied the presidential chair, which he then vacated in favour of Professor Ewart, who expressed his gratification at being honoured with the position, and trusted he would carry out the duties to their satisfaction.

NATURAL HISTORY NOTES

Mr. J. A. Kershaw, F.E.S., said that a request had recently been made for a short open season for Bronze-wing Pigeons, on account of the damage they cause to farmers' crops, and asked the opinion of those present. Mr. G. A. Keartland said from his observations he considered the Bronze-wing Pigeons eminently useful birds. At Narree Warren he had seen them feeding on the fruit of the African box-thorn, and did not consider them any detriment to farmers, as they usually feed on small seeds.

Mr. G. Coghill called attention to the splendid exhibit of *Epacris* blooms forwarded by Mr. A. G. Campbell from the Grampians, which was some of the finest ever exhibited at a meeting.

Mr. C. F. Cole mentioned the occurrence of a Bronze Cuckoo, *Chalcococcyx plagosus*, at East Malvern on 30th May last. This he considered as an instance of early arrival, not late departure.

EXHIBITS.

By Mr. R. W. Armitage.—Wood opal, sectioned and polished, showing annual rings, medullary rays, grub borings, bark, &c.—probably a casuarina, from Gawler, South Australia; also a casuarina stem, sectioned, for comparison; lignite, with fossil resin, from Eocene deposits, Parwan Valley, Ingliston.

By Mr. A. G. Campbell.—Flowers of *Epacris impressa*, various shades, from Grampians, near Pomonal.

By Mr. C. J. Gabriel.—Marine shells from Japan and Hong Kong.

By Miss H. Maddren.—Grass-stone from Central Queensland; shark's teeth and skin from Flinders; &c.

By Miss J. W. Raff, B.Sc.—Portion of Sheoak, *Casuarina distyla*, from near Blowhole, Tasmania. Having grown on the sea coast, salt has apparently been absorbed, and made the bark thicker and more fleshy, hence tending to crack when old and dry. After the usual conversazione the meeting terminated.

VISIT TO THE NATIONAL HERBARIUM.

ABOUT twenty members took part in the visit to the National Herbarium on Saturday afternoon, 12th June. Owing to the unavoidable absence of Professor Ewart, it devolved upon me to act as leader, and with the help of my fellow-assistant, Mr. J. W. Audas, I endeavoured to make the visit an instructive and enjoyable one. The members were shown a number of specimens new to science which have recently been named and described. Amongst these was a new genus and species, *Bellida graminea*, A. J. Ewart, which is very remarkable on account of its coloured pappus and curious achenes. About 20 plants new to science have been described and published during the past year, principally from Western Australia, including a new genus and species of Compositæ, *Gilruthia Osbornii*, Ewart and White. Two new species of Victorian plants—*Olearia (Aster) Toppii*, Ewart and White, from the North-West, collected by F. M. Reader, 1892 and 1904; also *Gnephosis Baracchiana*, Ewart and White, near Dimboola, St. Eloy Dalton—have also been named and described. The latter plant has an external resemblance to *Gnephosis skirrophora*, and from superficial examination might easily be confused with it, but is readily distinguished by the leaf-like bracts surrounding the main heads, by the pappus, and by the mucilaginous layer on the achene. Several new varieties have also been recorded and described. The Reader and Walter herbariums have now been incorporated with the main collections, and have made a fine addition to the Herbarium; thus all the new species described by Mr. Reader are now in the National Herbarium. The late Dr. Howitt's collection of eucalypts has also been added to the Herbarium. In addition over 4,000 sheets of herbarium specimens have been added to the main collections. Included in these are many of the plants recently described by Mr. J. H. Maiden, Government Botanist of New South Wales; also many rare plants from Europe, Asia, Africa, and America, while three hundred specimens of New Zealand plants have been added to that collection. Among other interesting items shown was a collection of pre-Linnean plants from Herb. Pettiver, collected over 200 years ago, which are still in good state of preservation. Also a collection of plants collected in Australia during the years 1802 to 1805 by Robt. Brown. It may be of interest to the members to know that

a separate collection of plants from the National Park, Wilson's Promontory, has been formed, which consists of over 400 species, mainly collected by the members of the National Herbarium excursion to the National Park during the past year. The method of fumigation by bi-sulphide of carbon vapour, by which the Herbarium collections are preserved from the attacks of the museum beetle, was also explained. As showing the daily work of the Herbarium, it may be mentioned, over 1,000 specimens of plants, weeds, &c., have been named for various correspondents, but few of these were worth preserving. The visitors were also shown over the library, and were greatly interested in the various scientific books, &c., contained therein. It was mentioned that several hundreds of books, pamphlets, &c., were recovered during the past year from the late Baron von Mueller's executors, thus filling up many of the gaps. The Herbarium is indebted to the Director of the Kew Herbarium for the completion of the sets of Hooker's "Icones Plantarum" and the Kew *Bulletin*, and to the British Museum for Banks and Solander's drawings of Capt. Cook's first voyage to Australia. More than 400 volumes and parts of journals, books, &c., have been received in interchange. Over 200 books and scientific periodicals have been added to the library by purchase, and in addition to these a considerable number of books have been purchased from the libraries of Messrs. Reader and W. R. Guilfoyle. The visitors were greatly interested in the various pre-Linnean works, of which the Herbarium possesses a very complete and valuable series. The total number of books in the library exceeds 8,000, a very large number being bound. Progress has been made in overtaking the arrears of binding for the past 30 years. Nearly 2,000 volumes have been bound during the past three years, and over 300 are now in the hands of the binder, or are in course of preparation for binding. Additional shelving has been added to provide for the steady expansion of the non-Australian herbarium, the shelves have been re-numbered, and the whole collection will be re-arranged shortly. Another work that has been taken up by the herbarium (in conjunction with the Botanical Department of the University) is the testing of seeds, as regards purity and germination value, a work which is of great importance to the agricultural interests, and which is capable of considerable extension with profit to the community. Various papers, &c., have been published from the Herbarium and Botanical Department of the University during the year. Included amongst these are "Contributions to the Flora of Australia" and "The Longevity of Seeds," &c. The publication of the short descriptions and illustrations of the proclaimed plants has now been completed, and these will also appear in a work entitled, "Weeds, Poison and Proclaimed Plants of Victoria,"

now in the hands of the Government Printer, in course of publication. With part ii. of this work will be issued the census of naturalized aliens and introduced exotics of this State, which will, no doubt, be very useful to the various botanical workers, and which gives some idea of the extraordinary way in which naturalized aliens, mostly obnoxious, are replacing our native flora.—J. R. TOVEY.

BOOK NOTICES.

A DESCRIPTIVE LIST OF THE BIRDS NATIVE TO VICTORIA, AUSTRALIA. Compiled by J. A. Leach, M.Sc., Organizing Inspector of Nature Study, Education Department, Victoria. Melbourne : J. Kemp, Government Printer. Price, 6d.

This is a re-issue, in handy size, of the "Circular of Information, No. 12, Nature Study," published as a supplement to the *Education Gazette* for December last. The utility of the list being quickly recognized, the original issue was soon exhausted, consequently it was decided to reprint the list in a smaller sized page, with such corrections and additions as were needed. As it is, it forms an excellent guide to the birds of Victoria, so far as can be accomplished without the aid of illustrations, and the compiler is to be congratulated on the simple way in which he has arranged his matter. The vernacular names are made the foundation of the scheme, and, with many other common or local names, are well indexed, so that there should be no difficulty in identifying the bird for which any of them may be used. The arrangement of the species is that adopted by Mr. Gregory Mathews, F.L.S., in his "Handlist of the Birds of Australia," recently published as a supplement to the *Emu*. The species are tabulated in columns as follows:—1. Number of species (of a genus, family, or order, &c.) found in Australia; 2. Number of species found in Victoria; 3. Names—vernacular, local, and scientific; 4. Total length of bird (including bill and tail) in inches; S. or N. Occurrence south or north of Main Divide, with further indications as to the frequency with which the species is likely to be met with; 5. Kind of country usually seen in; and 6. Remarks—these generally consist of the leading points necessary for the identification of the species. According to the list we have 389 species recorded for Victoria, of which 195 are common to both northern and southern Victoria; 71 are recorded for northern Victoria only; while 123 (including 60 sea and shore birds) have been recorded from southern Victoria only. That the list is a useful one is unnecessary to state, and we will be pleased to welcome others of a similar character, for which there is ample room.

A DESCRIPTIVE GUIDE TO THE BOTANIC GARDENS, MELBOURNE.
By W. R. Guilfoyle, F.L.S., Director. Melbourne : J. Kemp,
Government Printer. Price, one shilling.

The previous guide to the Gardens, noticed in these pages some time ago (*Vict. Nat.*, xix., p. 66) having been sold out, the Director, in issuing a new edition, has taken the opportunity to rewrite and considerably enlarge the handbook. Its value is greatly increased by the inclusion of a number of views of striking scenes, trees, &c., in the gardens, including a large panoramic view of that portion of the grounds which was added by the completion of the Yarra improvement works in 1905. A large coloured plan is included, but again no indication is given of its scale. We do not, however, see the necessity of repeating the plan of the gardens prior to 1873—byegones should be byegones. The book has no pretensions to be a complete catalogue of the plants to be found in the Gardens, but the "Descriptive Tour Through the Gardens" is very fully written, and indexed in such a way that the visitor entering at any of the gates can at once join the supposed party, and see for himself the more important trees, shrubs, &c., as he passes along. A reference to the smaller route map on page 19 will show that the whole of the Gardens is visited in turn. We regret that when issuing a new guide the opportunity was not taken of associating the late Baron von Mueller's name with one of the lawns, while the present Director's name should undoubtedly be associated with another, and we would suggest that the authorities be asked to alter the names of the "Eastern" and "Southern" lawns to "Mueller" and "Guilfoyle" lawns respectively. The list of memorial trees is rapidly increasing, but few of them will have greater interest to young Victorians than the grand old red gum figured on page 51, under which was held a notable political meeting on 1st July, 1851, when it was resolved to urge the separation of Victoria, or rather the Port Phillip District, from the mother colony, New South Wales, and the creation of a new colony. A plan of the system house will be found very useful by the student of botany, while the size of the blocks devoted to each order will give some indication of the importance of the various orders of plants. Plans are also given of the arrangement of the Museum of Economic Botany and Plant Products, which will be useful to the student wishing to rapidly find any particular specimen. An index of botanical names and another of common names complete the guide, which should have a ready sale.

The Victorian Naturalist.

VOL. XXVI.—No. 4. AUGUST 5, 1909.

No. 308.

FIELD NATURALISTS' CLUB OF VICTORIA.

THE monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 12th July, 1909.

*The president, Prof. A. J. Ewart, D.Sc., occupied the chair, and about 70 members and visitors were present.

REPORTS.

A report of the visit to the National Museum on Saturday, 10th July, was given by Mr. J. A. Kershaw, F.E.S., the Curator of Zoology, who reported a fair attendance of members. Attention was first of all directed to the collections of Victorian insects, more especially the butterflies and moths, with their life histories; then the other orders were inspected, as well as the Howitt collection of Coleoptera. The valuable Curtis collection of English Lepidoptera, which contains many rarities and some types, and which has been in the possession of the Museum for more than forty-five years, was also inspected, and seen to be in a splendid state of preservation. Some little time was also devoted to the fine series of skeletons now displayed for the instruction of students.

A report of the visit of the junior members to the botanical laboratory at the University on Saturday, 3rd July, was made. Miss Jean White, D.Sc., one of the demonstrators at the Biological School, took charge of the party, and a profitable afternoon was spent in examining different forms of leaves, &c.

ELECTION OF MEMBERS.

On a ballot being taken, Mr. J. F. Haase, Little Collins-street, City, was duly elected an ordinary member; and Miss V. Crockett, 104 Charles-street, Seddon, Miss V. Flee, 3 Pickett-street, Footscray, Miss V. Scott, 6 O'Farrell-street, Seddon, Miss D. White, 54 Pickett-street, Footscray, Miss D. Wyatt, Hobbs-street, Seddon, Master B. Coutts, Victoria-road, Camberwell, and Master J. Graham, Studley Park-road, Kew, were elected junior members of the Club.

GENERAL BUSINESS.

Mr. G. Coghill said that he thought it would be to the advantage of the Club if the associate members by a small extra charge could obtain the Club's journal monthly, and that the Committee had decided to call a special meeting for the next monthly meeting to consider the following alteration of clause *d*, rule 4, of which he gave notice, viz., that the words "provided that by payment of an additional sum of two shillings and sixpence

associates shall be entitled to receive the Club's journal monthly" be added after the word "shillings."

PAPERS READ.

1. By Mr. J. C. Goudie, entitled "Notes on the Coleoptera of North-Western Victoria, Part I."

In this paper, which was taken as read, the author enumerated the various species of beetles belonging to the families Cincindelidæ and Carabidæ, which he had met with in the Birchip and Sea Lake districts, and included a note by Mr. T. G. Sloane on the distribution of the Carabid groups dealt with in the paper. Useful notes were given as to the habitats and months of appearance of many of the species. As usual in Victoria the Cincindelidæ were poorly represented, only two species occurring, but of Carabidæ 102 were list, many of which appeared to be extremely rare.

2. By Mr. C. L. Barrett, entitled "A Naturalist in Bass Straits."

This took the form of a lecture illustrated by lantern slides, in which the author briefly described the route and sights met with by the Ornithologists' Union excursion in November last. He then gave some account of the trip made in the same locality in the Commonwealth trawler, *Endeavour*, and described the methods of trawling and dealing with the fish and other objects obtained.

The president remarked on the interesting nature of the author's communication, and several members discussed some of the points mentioned.

NATURAL HISTORY NOTE.

Mr. G. A. Kearthland said that he had noted the Spiny-cheeked Honey-eater, *Acanthogenys ruficularis*, at Preston a few days before, which he considered a very early appearance.

EXHIBITS.

By Mr. C. F. Cole.—Aboriginal tomahawk, found three feet below surface when draining land in the Gardiner's Creek valley at Malvern. About twenty have been found under similar circumstances in the same locality.

By Mr. A. Coles.—Male and female Whistling Duck, *Dendrocygna arcuata*, Cuv., shot at Werribee, 1st July, 1909.

By Mr. C. J. Gabriel.—Marine shells, twenty-two species of genus *Ovula*, from various localities.

By Mr. J. A. Kershaw, F.E.S.—Living Gecko Lizard, *Gymnodactylus milinsii*, Bory., Victoria.

By Master A. Pitcher.—A curious lichen, *Ramalina calcicaris*, var. *Eckloni*, from Newlyn, near Daylesford.

After the usual conversazione the meeting terminated.

NOTES ON THE COLEOPTERA OF NORTH-WESTERN VICTORIA.—PART I.

BY J. C. GOUDIE.

(Read before the Field Naturalists' Club of Victoria, 12th July, 1909.)

HAVING been engaged in collecting Coleoptera in the north-western or Mallee districts of Victoria for upwards of fifteen years, and having got together what may be regarded as a fairly representative collection, it has seemed to me that such work is not of much value unless published for the use of co-workers. To put it in the form of a list, according to the latest accepted classification, and with brief notes bearing on the habits, &c., of the species, seemed the most convenient way to handle the subject.

My collecting has been almost confined to the Birchip and Sea Lake districts and the country lying between these towns. Birchip is situated about 215 miles north-west from Melbourne, and Sea Lake is 40 miles further north, and close to the southern edge of Lake Tyrrell, approximately long. 143° E., lat. $35\frac{1}{2}^{\circ}$ S. Being comparatively new settlements, their names are only to be seen on the later railway maps.

With regard to the naming of the species—an important point—I may say that the names in this list may be relied on as authentic, specimens of all the species having been submitted to acknowledged authorities on Australian entomology. I have much pleasure in expressing my thanks to those who have helped in various ways, especially to Mr. A. M. Lea, F.E.S., Tasmanian State Entomologist, and Mr. T. G. Sloane, the well-known authority on Australian Carabidæ.

Two families, Cicindelidæ and Carabidæ, are now dealt with, and it is intended to complete the list by instalments, as time and opportunity will permit. There are a large number of species belonging to various families and genera which have not been satisfactorily identified, but it was not thought advisable to include these under the generic name only, though in some cases when one species only is known to occur its position has been indicated.

The numbers given are those of Master's Catalogue and Supplement, which will enable anyone interested to refer to the literature on the subject. The following note, kindly supplied by Mr. T. G. Sloane, throws some light on the probable origin and geographic dispersion of the principal Carabid groups dealt with in this paper:—

“The district over which Mr. Goudie has collected is part of Professor Spencer's great Eyrean sub-region of Australia, which, as shown in the map accompanying his ‘Summary of Results of the Horn Scientific Expedition,’ includes Australia generally except a narrow coastal strip extending easterly from King's

Sound in the north-west round Australia to the mouth of the Glenelg River. This coastal strip is divided by Professor Spencer at the Clarence River into two parts—viz., a northern ‘Torresian’ sub-region (in which New Guinea is included), and a southern ‘Bassian’ sub-region (in which Tasmania is included).

“The ‘Birchip-Sea Lake’ area partakes of the general poverty in Carabidæ which characterizes the Eyrean sub-region, and its Carabidæ show a decided preponderance of Eyrean types. Being situated near the confines of the Bassian sub-region, it has naturally received more genera and species from that sub-region than from the more distant Torresian sub-region. It has derived from the Bassian sub-region its Nomiini (an Antarctic element) and Lebiini. The Apotomini, Panageini, and Odacanthini have, no doubt, been derived indirectly from the Torresian sub-region—they are Oriental tribes now distributed generally over Australia. The Clivinini, Scaritini, Broscini, and Helluonini are represented by forms which are essentially Eyrean. The other tribes included in this local fauna are here composed of ordinary Australian forms, and have such a general distribution over Australia that more knowledge of the areas to which the different genera and species are limited will be required before it will be possible to divide them into geographical groups for the study of their geographical distribution.

“The general conclusions I arrive at from an examination of Mr. Goudie’s materials are—

“1. The Carabidæ in the main are composed of elements that are characteristic of the interior of extra-tropical and Western Australia.

“2. Owing to the arid summer and the low annual rainfall there is a marked absence of the types which reach their highest development in the more humid forests of the adjacent Bassian sub-region.—THOS. G. SLOANE. 6/6/09.”

CICINDELIDÆ.

4. *Megacephala (Tetracha) australis*, Chd. (Nov.)

This fine species is not common in the area under notice, but is said to be frequently met with along the course of the Murray, under logs, &c., close to the water.

13. *Cicindela semicincta*, Brullé (Nov.)

A widely distributed species, but rare in the Mallee. Habits similar to foregoing.

CARABIDÆ.

Tribe—CARABINI.

35. *Calosoma schayeri*, Er. (Nov.)

Tribe—CLIVINI.

509. *Clivina dilutipes*, Putz.

C. felix, Sloane, P.L.S. N.S.W., 1896, part 2, p. 213.

519. *C. melanopyga*, Putz.

496. *C. procera*, Putz. Included by Masters in Scolyptus.

C. queenslandica, Sl., l.c., p. 164.

C. tumidipes, Sl., l.c., p. 180.

The Clivini all have a strong family resemblance, being very narrow in proportion to their length, and generally of a pitchy-black colour. They are numerous and have a wide range in Australia, and are usually found along the margins of lakes and swamps hiding in cracks in the mud or under *débris* during the summer. On sultry evenings they are often attracted by a light. In 1896 Mr. T. G. Sloane published a fine monograph dealing with 83 species, and a number have been added since.

Tribe—SCARITINI.

460. *Scaraphites lenæus*, Westw. (May.)

A rare species, found on white sand-hills in Sea Lake district. Originally described from Swan River, W.A. The headquarters of this genus, of which there are fourteen species, is in Western Australia.

445. *Euryscaphus dilatatus*, MacI.

In burrows, March to November (rarely found at midsummer). One of the finest of the Victorian Scaritini. It has a lengthy synonymy. (Sloane, "Check-List of Australian Carabidæ," No. 132.)

347. *Carenum anthracinum*, MacI.

A common and very variable species, both as regards size and colour. It is often found on sand-hills, hiding under the tussocks of "porcupine grass."

C. cordipenne, Sl., P.L.S. N.S.W., 1897, part 1, p. 196 (Mar.-Nov.)

Peculiar amongst its congeners by the presence of "one or more setigerous punctures on the genæ below the antennal scrobes" (Sloane). A deep-burrowing species.

364. *C. dispar*, MacI. (?)

A single specimen is in the author's collection, taken on the rifle range at Birchip in September.

366. *C. elegans*, MacI. (Mar.-Nov.)

A brilliant green species, well deserving its name. Taken in burrows. Odd specimens found right through the summer.

C. imitator, Sl., l.c., p. 206.

Comparatively rare, found in burrows (Mar.-Nov.)

371. *C. interruptum*, MacI.

Mr. Sloane, in his "Check-List," gives six synonyms of this species, four being by Macleay.

404. *C. scaritoides*, Westw. (Mar.—Nov.)

Another much-described species. Being variable, and widely distributed, it has been known by eight different names since 1842. Practically a non-burrower.

335. *Carenum (Eutoma) tinctillatum*, Newm. (Aug.—Nov.)

Usually taken under logs in the vicinity of water. Ten synonyms appear in the "Check-List."

339. *Neocarenum elongatum*, Macl. (Aug.)

A single specimen is in my collection. It was found dead and badly mutilated.

7308. *Neoscaphus simplex*, Sl. (Aug.)

One specimen of this extremely rare Carenid was found 10 miles S.W. from Sea Lake, in dense mallee country. It was dead, but perfect. Mr. Sloane tells me it is the rarest southern Carenid.

7360. *Carenarchus fortis*, Blackb.

A great rarity. One specimen taken in open grassy country in October.

402. *Carenidium riverinæ*, Macl. (July—Nov.)

Formerly placed in the genus *Conopterum*. Two specimens obtained whilst digging post-holes, so it is evidently a burrower.

312. *C. superbum*, Cast.

A fine black species, with violaceous tints near the margins of upper surface. One specimen found near Birchip under a piece of wood in open country in May.

HARPALINÆ.

Harpalinæ—Unisetosæ.

Tribe—BROSCINI.

587. *Promecoderus concolor*, Germ. (March—Nov.)

A common and variable species, found under logs or stones, chiefly in grassy places.

633. *Cerotalis semiviolacea*, Cast. (March—Nov.)

In general appearance and habits this species resembles *Promecoderus concolor*, but may be distinguished by its more shining appearance, by its blue colour underneath, and by the absence of a tooth to the mentum or chin.

7419. *Parroa apicalis*, Sl.

This fine insect is included amongst the list of novelties obtained by the Elder Exploring Expedition in Central Australia. But the place of its capture—*i.e.*, of the type specimen—seems not to have been recorded. One specimen was found on the ground, under a piece of bark, in May, 10 miles south-west from Sea Lake.

Tribe—APOTOMINI.

285. *Apotomus australis*, Cast. (July).

My specimens were taken floating in water-channels, so that it may not really be a local species.

Tribe—HARPALINI.

656. *Gnathaphanus adalaidæ*, Cast. (Sept.—Nov.)

This typical Harpalid is found throughout Australia and Tasmania, and is very common in the springtime.

G. latus, Sl., P.L.S. N.S.W., 1899, part 4, p. 455.

I have taken this species under logs at Green Lake, 6 miles south of Sea Lake, in November.

7436. *Phorticosomus brunneus*, Blkb.

678. *Hypharpax deyrollei*, Cast.

7456. *H. inornatus*, Germ. (Sept.—April).

Often found in flood waters.

7461. *H. vilis*, Blkb.

This and the three preceding species are similar in their habits. During the winter months they appear to burrow into the ground and remain in a semi-torpid condition until the warm weather sets in.

668. *Cenogmus rotundicollis*, Cast. (May—Nov.)

669. *C. waterhousei*, Cast. (May—Nov.)

The species belonging to this genus were formerly placed in *Anisodactylus*, but were removed to *Cenogmus* by Mr. Sloane in 1898, on the ground that the former genus did not properly belong to Australia.

Notophilus gracilis, Blkb.

N. latus, Blkb.

I have found both these species under *débris* round the edges of waterholes in October.

646. *Psilonothus (Amblygnathus) minutus*, Cast.

This highly-polished little Harpalid is found in the Sea Lake district on sand-hills, under logs and sticks, &c., in November. I include it in *Psilonothus* on Mr. Sloane's authority, who considers that *Amblygnathus* is not an Australian genus.

7462. *Thenarotes australis*, Blkb.

7463. *T. discoidalis*, Blkb.

707. *T. tasmanicus*, Bates.

Three well-known species, usually found on the margins of waterholes. On sultry summer evenings they sometimes fly indoors to the light in large numbers.

Tribe—CHLÆNINI.

567. *Oodes inornatus*, Cast.

571. *O. modestus*, Cast.

These two species have a decided partiality for the water's

edge, hiding under logs or other shelter. I have taken them in November.

541. *Chlenius australis*, Dej.

7402. *C. laticinctus*, Chd.

Taken abundantly round the margins of lakes and swamps in early summer.

HARPALINÆ.

Harpalinæ—Bisetosæ.

Tribe—PANAGÆINI.

532. *Epicosmus australasicus*, Chd. (August).

A well-known and widely distributed species. About twelve years ago it was very numerous in the Birchip district, but since then it has become almost extinct.

Tribe—BEMBIDIINI.

953. *Bembidium jacksoniense*, Guer.

This small, active species may be seen in large numbers in the spring running on the mud at the edges of waterholes. *B. subviride*, MacL., and *B. ocellatum*, Blkb., are listed as synonyms, M. C. Supp., p. 694.

Tribe—NOMIINI.

923. *Mecyclothorax ambiguus*, Er.

7486. *M. curtus*, Sl.

Very rare. Described in 1894 from a single specimen found at Bendigo by Mr. W. W. Froggatt. My specimen was taken under dry leaves.

7488. *Mecyclothorax fortis*, Blkb. (May).

650. *M. lateralis*, Cast. (Nov.)

7491. *M. punctatus*, Sl. (Sept.)

The species of *Mecyclothorax* known to me are all similar in their habits, being found on the ground under dry leaves during the winter and spring.

M. punctatus, Sl., is remarkable in having the prothorax strongly punctate.

7509. *Epelyx lindensis*, Blkb.

Found (rarely) on tree trunks, sometimes under the bark.

7499. *Amblytelus brevis*, Blkb. (Sept.)

A. discoidalis, Blkb. (Sept.)

Taken under bark on tree trunks. From the habits and appearance of this genus one would expect it to be allied to the *Lebiini*.

Tribe—TRIGONOTOMINI.

Sub-tribe—*Morionini*.

288. *Hyperion schræatteri*, Schreib.

This giant among Carabs is rarely taken here. One of my

specimens was found in the interior of the trunk of a large hollow "Box" tree in October. The hollow was filled with damp earthy material, in which were a number of Scarabæidæ and their larvæ. Nothing appears to be known of the larval stage of Hyperion, thus leaving an interesting entomological problem to be solved.

761. *Catadromus lacordairei*, Boisd. (July–Nov.)

A fine, ornate species, widely dispersed; usually found in damp situations.

C. latro, Tsch.

A larger species than the last-mentioned. Taken under logs near water.

Tribe—TRIGONOTOMINI.

867. *Rhytisternus cyathoderus*, Chd.

868. *R. levilaterus*, Chd. (July–Nov.)

Taken generally in open, grassy country, under logs, &c. They resemble the species of *Sarticus* to a certain extent, but are more depressed in form. Mr. Sloane has given a very useful tabular view of twelve species (P.L.S. N.S.W., 1894, 2nd series, p. 437).

Sarticus discopunctatus, Chd.

S. esmeraldipennis, Cast.

Two very common species. Taken almost anywhere, under logs, &c., from March to December. *S. esmeraldipennis*, Cast., is given as a synonym of *S. obesula*, Chd., in Master's Catalogue. Mr. Sloane, however, regards *S. esmeraldipennis* as a good species, and has redescribed it (P.L.S. N.S.W., 1903, part 3, p. 617).

878. *Chlenioidius mellei*, Montr., Ann. Fr., 1860, p. 238.

This species is well known as *C. herbaceus*, Chd. The following note by Mr. Sloane explains the change of name:—"It was described from New Caledonia (where also *C. proluxus*, Er., is found) by Montrousier in 1860. Chaudoir did not describe it as *C. herbaceus* till 1865, so his name sinks to a synonym of *C. mellei*, Montr."

881. *C. proluxus*, Er.

909. *Simodontus australis*, Dej. (April–Dec.)

S. mandibularis, Sl., P.L.S. N.S.W., 1894, part 4, p. 574.

Both species occur plentifully throughout the Mallee, sheltering under sticks, &c.

Tribe—SPHODRINI.

Læmostenus complanatus, Dej.

An introduced European insect, known for nearly 20 years in Australia as *Pristonychus australis*, Blkb. Sometimes found in houses and grain sheds.

926. *Platynus marginicollis*, Macl. (Nov.)

Very plentiful under logs near water.

Tribe—LICININI.

Some years ago I took a specimen of what appears to be an undetermined species of *Microferonia* under a stone near Birchip.

581. *Physolesthus saturalis*, Cast.

Found under logs at Green Lake in November.

913. *Dicrochile goryi*, Boisd. (Nov.)

918. *D. quadricollis*, Cast. (Nov.)

These two species are sometimes taken in arid situations, but, like most Carabidæ, they prefer the vicinity of water.

Tribe—ODACANTHINI.

Endalia niger, Sl., P.L.S. N.S.W., part 4, p. 581.

A rare species; easily recognized by its shining black colour, small prothorax, and bicoloured legs. My specimen was taken under a stick at the edge of a waterhole at Sea Lake, in November.

Tribe—LEBIIINI.

The insects placed in this tribe appear to be, with the exception of the three genera placed at the end (*Homethes*, *Dromius*, and *Scopodes*), arboreal in their habits. At any rate, they hide by day under the loose bark of trees, their flattened form being specially adapted for this mode of concealment. When collecting them it is a good plan to spread a piece of white cloth at the base of the tree, as the insects falling on it can be easily seen and captured.

Xanthophæa loweri, Blkb. (May-Dec.), P.L.S. N.S.W., (2), v., 1890, p. 304.

This species is peculiar in that it is found under the bark of dead trees.

104. *Trigonothops flavofasciata*, Chd. (March-Dec.)

108. *T. pacifica*, Er. (March-Dec.)

7246. *Diabaticus minor*, Blkb.

Not common in the Mallee districts. My specimen found amongst dry leaves in September.

The genus *Phlæocarabus* is represented by at least one species, but this has not yet been satisfactorily identified.

181. *Agonochila biguttata*, Chd. (Oct.)

7275. *A. fenestrata*, Blkb. (May-Dec.)

187. *A. lutosa*, Newm. (May-Dec.)

164. *Philophlæus eucalypti*, Germ. (May-Dec.)

167. *P. immaculatus*, Chd. (May-Dec.)

7271. *P. opaciceps*, Blkb. (May-Dec.)

176. *P. quadripennis*, Chd. (May-Dec.)

178. *P. unicolor*, Chd. (May-Dec.)

The species of *Philophlæus* have in many cases a close general resemblance to each other, more particularly those of a uniform

colour, the sculpture of the prothorax being one of the chief points of distinction. An excellent paper on the Lebiini, with tabulations of genera and species, and many valuable notes, was published by Mr. T. G. Sloane some years ago (*vide* P.L.S. N.S.W., 1898, part 3, p. 492).

- 134. *Homethes guttifer*, Germ.
- 7250. *H. gracilis*, Blkb.
- 140. *Microlestes* (*Dromius*) *humeralis*, MacI.
- 206. *Scopodes boops*, Er.
- 210. *S. sigillatus*, Germ.

The species belonging to the three latter genera are found on the ground under dry leaves, &c. They are elegant in shape, and quick in action. The species of *Scopodes* may be likened to miniature "Tiger-beetles." All met with during the greater part of the year, but chiefly in spring and early summer.

Tribe—HELLUONINI.

Gigadema carbonaria, Sl., M.S.S. (May–Nov).

- 82. *G. longipenna*, Germ.

These fine Carabs are usually found under the loose bark of dead trees, sometimes in considerable numbers. Fourteen species are listed in Master's Catalogue, many of them being much alike, and, consequently, somewhat of a puzzle to entomologists.

PSEUDOMORPHINI.

Dr. Horn makes this aberrant group a sub-family and places it last. Two genera are catalogued as Australian—viz., *Silphomorpha* and *Adelotopus*, the species of which are far removed in appearance from typical Carabidæ, being, in fact, more like water-beetles, and in some cases resembling some of the species of *Pterohelæus*, of the *Tenebrionidæ*. They live on tree-trunks under the loose bark, and on a hot day are very active.

- 220. *Silphomorpha scolybetioides* Westw. (March–Nov.)
- 225 *S. fallax*, Westw. (March–Nov.)
- 229. *S. hydroporoides*, Westw. (March–Nov.)
- 232. *S. maculata*, Newm. (March–Nov.)
- 248. *S. suturalis*, Germ. (March–Nov.)
- 254. *Adelotopus aphodioides*, Westw.
- 256. *A. bicolor*, Cast.
- 262. *Adelotopus dytiscoides*, Newm.
- A. insignis*, Sl., M.S.S.

NOTE.—The dates mentioned for the occurrence of many of the species are not in any case meant to be arbitrary, but are included as a tentative effort in the direction of an "entomological calendar."

BOOK NOTICES.

VICTORIAN HILL AND DALE. By T. S. Hall, M.A., D.Sc.,
Lecturer in Biology, University of Melbourne. Melbourne :
T. C. Lothian. Price, 3s.

This little volume of 160 pages is the first attempt to place the geology of Melbourne and a few other centres in Victoria before the general reader in a popular manner. The work is the outcome of a series of articles contributed to the *Argus* in 1905-6 by Dr. Hall, which were so much appreciated that a desire was expressed for them in book form. With the additional help of forty illustrations and maps the author has arranged his story so clearly that the average student should have no difficulty in grasping the main facts of the why and wherefore of the hills and valleys around us. Technical language is conspicuous by its absence, but a useful appendix shows the geological age of the various rock series mentioned.

HANDBOOK OF DESTRUCTIVE INSECTS OF VICTORIA (Part IV.)
By C. French, F.L.S., F.E.S., Government Entomologist.
Melbourne : Osboldstone and Co. Price, 2s. 6d.

It is greatly to be regretted that the Department of Agriculture is not provided with sufficient funds for the publication of its "Handbook of Destructive Insects" at shorter intervals. Reference to Part III. will show that nearly nine years have elapsed since its appearance. That it is not the talented author's fault is shown by the fact that he has sufficient material prepared for two more parts, which, at the present rate of progress, will not appear till long after those who are anxiously waiting for the information will have ceased to require it. The only point of satisfaction in connection with the delay is that in the interval the three-colour process of illustrating has been developed, and the 34 plates in the present part are fine specimens of that work, and portray the various species even more faithfully than did the lithographs of the earlier parts. Following the plan of the last part, Mr. French has included plates and descriptions of 14 useful birds, so that farmers, &c., may have no difficulty in recognizing their friends. The 20 plates and descriptions of insects include a number of species which are chiefly destructive to our forest trees rather than to fruit trees, but there is always the risk that as the former become fewer, the insects will take to cultivated trees, as has happened in the case of the apple root-borer, &c. It is needless to say that the work is written with Mr. French's usual thoroughness, the illustrations are mostly from drawings by Mr. C. C. Brittlebank, while Messrs. Osboldstone have done their part of the work excellently. For those whose duty it is to keep within the law a list of the proclaimed insect and fungus pests is included, as well as the amended *Vegetation Diseases Act* and its schedules, while a useful appendix gives the latest particulars as to materials in use for the destruction of noxious insects and methods of use.

The Victorian Naturalist.

VOL. XXVI.—No. 5. SEPTEMBER 9, 1909. No. 309.

FIELD NATURALISTS' CLUB OF VICTORIA.

A SPECIAL general meeting of the Club was held at the Royal Society's Hall on Monday evening, 9th August, 1909.

Mr. J. A. Leach, M.Sc., one of the vice-presidents, occupied the chair, and about 50 members were present.

In accordance with notice given at the previous ordinary meeting Mr. G. Coghill moved—"That the following alteration be made in clause *d* of rule 4, viz., that after the word 'shillings' the words 'provided that on payment of an additional two shillings and sixpence such associate shall be entitled to receive the Club's journal monthly' be added." He considered that the associate members, who, it must be remembered, were under the age of twenty, would take a greater interest in the Club work if at a small extra expense they could obtain the Club's journal.

The motion was seconded by Mr. R. W. Armitage, and carried unanimously.

The business of the ordinary meeting was then proceeded with.

REPORTS.

A report of the junior excursion to Sandringham on Saturday, 7th August, was given by the leader, Dr. C. S. Sutton, who reported an excellent attendance, about 40 juniors being present. The date proved to be somewhat early for the present season, as only some 25 plants were found in bloom. However, several interesting species, such as the orchids *Corysanthes pruinosa*, *Pterostylis vittata*, and *Acianthus exsertus*, were obtained. Many questions were put by the young folks, and notes taken down, so that he considered the afternoon had been well spent. The day was extremely fine, and everybody seemed to enjoy the outing.

ELECTION OF MEMBERS.

On a ballot being taken, Mr. Frank C. Bury, Hoyt-street, Brighton, and Mr. Gerald F. Hill were duly elected ordinary members; Master C. Raff, Elsternwick, an associate; and Masters John Barbour, Yass, N.S.W., and S. H. Mereweather, Loch-street, Camberwell, junior members of the Club.

GENERAL BUSINESS.

A circular letter was read from the Kernot Memorial Committee, containing the various suggestions by which the deep interest of the late Professor Kernot, for many years president of the Royal Society, in scientific matters, might be recognized, and soliciting subscriptions to the proposed memorial.

Mr. G. Coghill called attention to several inaccuracies in recent

natural history notes in the public press, and thought an effort should be made to have them corrected, but it was generally considered that individual action would be the better way of calling attention to the mistakes.

PAPER READ.

By Mr. A. H. E. Mattingley, C.M.Z.S., entitled "In the Heart of the Mallee."

The author's remarks were well illustrated by a fine series of lantern views depicting the scenery and the many interesting birds, &c., met with during a visit to the Pine Plains district, some 35 miles north-west of Hopetoun. He pointed out that, instead of being, as most people thought, a treeless, sandy waste, the country known as the "Mallee" was really one of the best parts of Victoria for studying natural history. Though comparatively level, and at only moderate elevation above the sea, the Mallee contained an infinite variety of vegetation, ranging from Murray pines forty to fifty feet high to the smallest herb, and consequently the bird-life was also very varied. His friend, Mr. C. M'Lellan, who had spent a number of years in the district, had recorded 175 species, among which were included several almost confined to the locality. Open grass plains, often dotted with red gums, occurred at intervals, and provided nourishment for the pastoralists' stock. Many of the pictures were obtained under considerable difficulties, but, notwithstanding, they proved of great interest, and clearly demonstrated that the Mallee is very different from the general impression which prevails in the ordinary mind.

The chairman expressed his pleasure at the author's descriptions, which recalled many scenes familiar to him during a residence of some months in north-west Victoria.

Mr. C. French, jun., who had collected in the same district some years before, also spoke in support of the author's statements.

NATURAL HISTORY NOTE.

SPIDERS.—Mr. R. Kelly forwarded a note calling attention to an extraordinary occurrence of quantities of spiders' webs at Healesville in June last, which seemed to have been spun to enable the spiders to escape from the flood waters then prevailing.

EXHIBITS.

By Mr. C. J. Gabriel.—Marine shells, *Spondylus gæderopus*, Linn., from the Mediterranean; *S. aurantius*, Lam., from Philippine Is.; *S. imperialis*, Chem., from China; and *S. americanus*, Lam., from West Indies.

By Mr. R. Kelly.—Photographs of spiders' webs at Healesville.

By Miss Lazarus.—Ivory nut from Solomon Is.

By Mr. A. H. E. Mattingley, C.M.Z.S.—A snake-lizard, *Lialis burtoni*, from the Mallee, in illustration of paper.

After the usual conversazione the meeting closed.

A NATURALIST IN BASS STRAIT.

BY CHARLES L. BARRETT.

(Read before the Field Naturalists' Club of Victoria, 12th July, 1909.)

To a Victorian naturalist, whatever his "specialty" may be, the islands of Bass Strait offer much of interest. But the ornithologist should be happier among the islands than all other lovers of nature, for the sea-birds nest on these lonely specks of land. Thousands of gannets and black cormorants may be seen on their nests, while in burrows beneath the tussocky grass are the homes of countless petrels and penguins. Along the desolate shores, rock-strewn and patterned with dead sea tresses, sharp eyes may find the primitive nests of terns and dottrels and oystercatchers, and the scanty vegetation of some of the isles yields many interesting "finds" to the diligent oologist.

I have made two brief voyages in Bass Strait within the past twelve months, and of these I propose to give some account. My first trip was made as a member of the expedition arranged by the Australasian Ornithologists' Union, under the leadership of Mr. A. H. E. Mattingley, C.M.Z.S. The s.s. *Manawatu* was chartered for a moderate sum, and for fifteen days she was the ark of refuge for a large party (26) of naturalists.

We left Melbourne at midnight on 24th November, 1908, and ran to Western Port Bay before a favouring wind. A brief stay was made at Flinders, and then the steamer headed for Seal Rocks. As we approached this haunt of the seals, hundreds of the animals could be seen in the water, and from the rocks came, borne on the wind, the sound of their voices. The rookery presented a "moving spectacle," as we surveyed it through binoculars from the steamer's deck. Huge brown forms were clambering among the pools and darting in and out of the surf, while sleek cubs lay basking in the sunlight beside their anxious mothers. Mr. Mattingley, accompanied by Dr. Lempriere and the cinematograph operator, landed from a motor launch, after great difficulty, and stayed on the rocks for several hours. They succeeded in obtaining some fine snapshots and one or two "moving pictures."

From Seal Rocks our little steamer made heavy weather to Currie Harbour, on the west coast of King Island, where she had to shelter for a day. The members of the expedition split up into small parties for rambles ashore. Accompanied by Mr. E. B. Nicholls and three King Islanders, I rode across to the east coast, and visited Sea Elephant River and the site of the proposed new harbour. We had a glorious gallop over the heathy downs and along the firm white beach, which was strewn with large bivalve shells, strange fishes, and sea-weed, for it was the morning after a great storm. The ride "home" to Currie in the twilight

was pleasant indeed. The air was fragrant of "melilot" and clover, and the light at the harbour's mouth beamed a welcome.

Next morning the *Manawatu* steamed to Seal River Bay, where the famous sand-blow was searched by Mr. J. A. Kershaw and others, who made a fine collection of "bones." We had hoped to make a landing on Albatross Island, but it was not to be. When the granite cliffs loomed on our starboard bow the foam was seen to be spouting high upon them, and our skipper declined to risk his boat. We could make out the white forms of the birds, seated serenely on their nests, above the reach of the breaking waves and as unattainable to us.

At dusk we anchored in Chimney Corner Bay, Three Hummock Island. Soon after daylight a party went ashore, to be welcomed by a herdsman and his wife and three children, who are sole habitants of the island. There was little of interest on Three Hummock, and we were all glad to be aboard and under weigh again.

Penguin Island was the next place of call, and here those bird-lovers who braved the landing, which was most difficult and dangerous, were rewarded. The summit of the island was riddled with penguin burrows, which made upright walking an impossibility. Every minute somebody stumbled in a burrow, and I fear many an unfortunate bird was crushed to death. On the narrow end of the island we found the pelican rookery described by Mr. J. Gabriel in the *Naturalist* * many years ago. There were eight nests, each containing a pair of eggs. Several of these were addled. The birds flew out to sea before our boat was a cable's length from the steamer's side, and the cinematograph operator had nothing to do but mourn over the stupidity of the pelican.

With Penguin Island the first half of our voyage was ended. We ran into Devonport, Tasmania, to take in fresh stores, and thence set a course for the Furneaux Group. Cape Barren Island was first visited, and our party spent a pleasant day at Franklin settlement among the half-castes. Mr. Knight, the schoolmaster, told us many interesting stories of his "people," and the half-castes themselves were communicative on some subjects, especially their wrongs. They are certainly an unfortunate community.

Coasting along Flinders, we dropped a small party at the north-east end of the big island, and then steamed away to Babel Island. Despite gloomy prophecies by the skipper and the mate, no difficulty was experienced in landing on Cat Island, where the great gannet rookery was in full swing. The rookery has been

* *Vict. Nat.*, xiii. (1896), p. 9.

described often before, and I have nothing fresh to add, save that the number of birds breeding seems to be the same as when Mr. Gabriel visited Cat Island a score of years ago. Storehouse Island was also visited, and several cormorant rookeries were examined. Excellent cinematographs were obtained of both gannets and cormorants.

After a rough passage, we steamed into the quiet harbour of Kent Group, to the south-east of Wilson's Promontory. The light-keeper, Captain Robinson, and his pleasant family gave us a hearty welcome, and we were sorry indeed we had to say good-bye. The homeward voyage was full of incident, and once, off the Promontory, the *Manawatu* was so buffeted by wind and wave that she could make no headway under full steam for some time. But the stout little craft won through, and once under the lee of the Promontory all was smooth steaming. Still the trip had a "sideways ending," for the *Manawatu*, after casting anchor in the channel at San Remo, was left high and dry at ebb tide, and the members of the expedition practically walked ashore.

My second trip to Bass Strait was made in May, 1909. By good fortune I was enabled to secure a berth on the Commonwealth fisheries investigation vessel *Endeavour* for one of her short cruises.

The *Endeavour*, which was built at the Government dockyards, Sydney, where, too, all her machinery was constructed, is a splendid sea boat. Modelled on the lines of a Norwegian type of trawling vessel, the *Endeavour* measures 135 feet over all by 23 feet 6 inches beam and 11 feet 6 inches depth. Her engines are of the most modern design, and she is capable of a speed of 12½ knots. She is provided with a Hercules refrigerating machine and a large steam trawl winch, weighing 11 tons and carrying 500 fathoms of 5-inch wire on each drum. The chief engineer is Mr. W. T. Anderson. The "fittings" of the trawler are all of the best. The saloon is small, but elegant and comfortable, and the cabins occupied by the director (Mr. H. C. Dannevig) and the chief officers are very pleasant apartments. Nor are the members of the crew neglected; their quarters are roomy and comfortable, and as strict cleanliness is enforced, the *Endeavour* may be regarded as a model for shipmasters. I spent much of my time in the laboratory, which, if the space is confined, is fitted with all manner of scientific conveniences. This is the special sanctum of the assistant investigator, Mr. Burford. Captain Cartwright, an experienced navigator, has quarters on deck—a cabin and chart-room combined.

Everyone on board was eager to assist me in my endeavours to gain knowledge. As a pressman I was a "chiel amang them takin' notes," and I can only say that but for the kindness of Mr. Dannevig and all those associated with him those notes would

have contained many an error. My thanks are due also to Mr. N. Lockyer, Assistant Comptroller of Customs, on whose recommendation to the Minister the invitation was given to my paper to send a representative with the trawler on her cruise last May.

We experienced very stormy weather during nearly the whole of the trip, and were compelled to shelter every night under the lee of the nearest island. The first trawl was shot in 16 fathoms, off Sealers' Cove, east of Wilson's Promontory, but the ground proved so unsuitable that the net was badly torn. This necessitated a "stay of proceedings" for some hours while broken meshes were repaired, so we steamed into Murray Pass (Kent Group) and anchored for the night. Before noon on the following day we left our anchorage and set a course for Flinders Island. But the weather was "dirty," and it took the *Endeavour* many an hour to cross the fifty miles of heaving sea; and when we got to Flinders the sea was so stormy that our skipper was compelled to shelter in Endeavour Bay. Late in the evening we ran across to West Sister Island (six miles), and on the morrow (Sunday) the men were given a run ashore.

It was not until 17th May that the "fishing grounds" were reached. Off Babel Island, at daylight, the trawl was shot in 45 fathoms, and after being towed astern for two hours the "cod end," or basket portion of the net, was wound in board by the great steam winch. The catch was a good one. The "cod end" was opened, and a stream of fishes of many species flowed into the "ponds" on deck. Among others I noticed large grey flat-head, "jackasses," silks, gurnets, rock cod, ling, and a miscellaneous assortment of electric rays, small sharks, leatherjackets or file fish, globe fish, toad fish and other "rubbish."

Half a dozen men at once set to work sorting the good or edible fishes from the "rubbish." The rejected ones were cast overboard, while the chosen suffered the horrible process known as "gutting." After being thoroughly washed, the fishes were stowed on shelves in the refrigerating chamber. This is an outline of the work carried out on the trawler as regards fishing. The trawl is cast overboard as soon as the "cod end" has yielded its catch, and the work goes on from dawn till long after the port lights are lit. It was very interesting to watch for a while, but soon became monotonous, save when the sorting was going on, and as a naturalist (albeit one knowing little about fishes), I was ever on the watch for curious specimens. But trawling is only part of the *Endeavour's* *raison d'être*. Under the supervision of the director, soundings are constantly made, and the temperature of the sea water at different depths ascertained and recorded.

It is perhaps too early to express any opinion as to the possibility of establishing a trawling industry in Bass Strait. The

Endeavour must make many more trips before even the experts can venture to speak with authority. But, apart from the economical aspect of the trawler's work, surely the Federal Government is justified in keeping her in commission to the end that science may be advanced. For that the scientific work which Mr. Dannevig and his assistants are carrying out is of value, and will add much to our knowledge of Australia's marine fauna, none can doubt.

[The paper was illustrated with a number of excellent lantern views.—ED. *Vict. Nat.*]

DESCRIPTION OF A NEW SPECIES OF ACANTHIZA, FROM WESTERN AUSTRALIA.

BY ALFRED J. NORTH, C.M.Z.S., C.M.B.O.U., Ornithologist
to the Australian Museum, Sydney.*

MR. R. Etheridge, Curator of the Australian Museum, has placed in my hands for determination a parcel of bird-skins received from Mr. H. L. White, of Belltrees, Scone, New South Wales, and collected for him by Mr. F. Lawson Whitlock, in the vicinity of Lake Way, East Murchison District, Western Australia. Although only a small collection, it contains some interesting forms, notably *Cinclosoma marginatum*, *Acanthiza robustirostris*, *Climacteris superciliosa*, and three specimens of an apparently new species of *Acanthiza*, which may be characterized as follows:—

ACANTHIZA WHITLOCKI, *sp. nov.*

Adult Male.—General colour above pale greyish-brown; upper wing-coverts like the back, some of the outer greater series with darker brown centres; quills brown, the primaries externally edged with ashy-white, the secondaries broadly margined with greyish-brown on their outer webs; upper tail-coverts light rufous brown; tail feathers pale brown, crossed with a broad sub-terminal black band, less distinct on the central pair, and having a spot of white extending about half-way across the tip of the inner web, and which is smaller and less distinct towards the central pair; feathers on the forehead blackish with whity-brown margins; lores and ear coverts whitish, the latter with narrow indistinct blackish margins; all the under surface white, the feathers of the chin, throat, and fore-neck with blackish margins, those of the breast faintly tinged with fulvous; lower sides of the body and under tail coverts pale fulvous; "bill black; legs and feet black; iris red" (Whitlock). Total length, 4 inches; wing, 2; tail, 1.9; bill, 0.4; tarsus, 0.8.

Adult Female.—Similar in plumage to the male.

* Contributions from the Australian Museum, by permission of the Trustees.

Habitat.—Lake Way, East Murchison District, Western Australia.

Remarks.—Mr. H. L. White has done much recently to advance Australian ornithology, and, in compliance with a request, I have therefore much pleasure in associating with the present species the name of Mr. F. Lawson Whitlock, who has collected during the past few years for the Perth Museum and for Mr. White in different parts of Western and North-Western Australia.

Acanthiza whitlocki, of which two adult males and an adult female were obtained, is more nearly allied to *A. apicalis*. From that species, however, it may be distinguished by its greyish-brown instead of olive-brown upper parts, rendering the rufous-brown upper tail coverts more conspicuous, by its purer white under parts, and the broader black sub-terminal band on the tail feathers. Vernacularly it may be distinguished as Whitlock's Thornbill.

Possibly referable to this species is a mutilated flat skin I received in 1906 from Mr. Chas. G. Gibson, the Assistant Government Geologist of Western Australia, who was collecting in the Lake Way district during that year. This skin, which was forwarded to me under the name of *Acanthiza pyrrhopygia* (?), is, however, more of an olive-brown on the upper parts, but the entire skin and feathers of the breast and abdomen are missing.

THE FOX AND ITS VICTIMS: A SERIOUS SITUATION.

THE following article, contributed to the columns of the *Argus* of Saturday, 28th August, by "Wanda," points to a very serious result from the increase of foxes, which, we fear, is not realized either by the authorities or the general public, and should serve to warn others, who may be contemplating elsewhere the introduction of foreign creatures, as to the possible results:—

I am afraid it will eventually be agreed that the fox is the worst of those three great pests which we owe to unthinking acclimatising enthusiasts. The sparrow is limited in its scope of action, and the rabbit can be turned to commercial use. But the range and scope of the fox is, in a sense, unlimited, and he is commercially worthless. Like both the rabbit and the sparrow, the fox has found this country so suitable, both as regards climate and food, that he is spreading and increasing in numbers much quicker than he does in his native land. In England the utmost care has to be taken of him, so that a sufficient number may be annually available for the national sport of fox-hunting. Foxes, in England, are practically never shot, trapped, or poisoned, yet they are never over-abundant. Here every man's hand is against

them, and the State pays a bounty for their scalps ; and in spite of it all, they are increasing rapidly every year.

When foxes were first introduced, the principal fear expressed was that they might turn out to be troublesome to sheep-breeders. It was also thought that the farmers' hen-roosts might suffer. But no one seems to have taken into account the probable effect that they would have upon our native animals and birds. As it happens, the damage they have done amongst the pastoralists' flocks and the country poultry-yards is comparatively small. In some districts, where other food is scarce, they take an annual toll of lambs and cast ewes ; but over large areas they exist side by side with the sheep, and give the farmer or the squatter no trouble. Their principal food is the omnipresent rabbit, and there is no doubt that, from year to year, they account for a large number of these pests.

But the great objection to the fox is that he is a born hunter, and has an insatiable lust for blood. If he gets the opportunity to kill he seizes it eagerly, quite apart from whether he is hungry or not. Curiously enough, the fox is a very small eater, and the average fox will thrive on what would be a starvation allowance to a dog of his size. But though he only requires small quantities of food, he is always on the look-out for food of a special quality, and he delights in hunting for it. With regard to the killing of lambs, the fox almost invariably eats only the tongue of his victim. This is so extremely small that lamb after lamb is killed before the slaughterer has secured a decent meal. In this case, too, it is probable that the love of killing is partly responsible for the death of many of the lambs. When a fox gets into a hen-roost much the same thing occurs. Everything is killed, and, unless the fox happens to be particularly hungry, very little is eaten.

This is the instinct which has made the fox such a danger to our native fauna. Unfortunately for our wild birds and animals, the life of security that they led prior to the coming of the fox has made them an easy victim in most cases to their new and cunning foe. Previously the dingo and the native cat were their only enemies ; but from neither of these did they suffer a tithe of what they now undergo from the teeth of the fox. I have made a list of the native birds and animals that are suffering from the attack of the fox, and it is appalling in its completeness. For the fox is so catholic in his taste that nothing in fur or feathers seems to come amiss to him. Even the strong-smelling and sinewy 'possum is a constant victim. The 'possum is a good example of how long-existing previous immunity leads to habits of carelessness. So long as he keeps in the trees, the 'possum, of course, is safe. But it is the invariable habit of this animal to come to the ground in the course of the night, and to wander

from tree to tree. All of our ground-dwelling animals, such as the bandicoot and the kangaroo rat, suffer very severely, as they are quite helpless against such a large, active, and eager enemy as the fox.

But, although the furry tribe are suffering badly, by far the most serious of the fox's depredations are those upon our birds. It happens, unfortunately, that a large number of our finest birds are ground-frequenting in their habits. Some of them, such as the emu, the wild turkey, and the swan, do not use trees at all; while others, such as the lyre-bird and the duck family, use them to only a limited extent. And it can be laid down as an axiom that all birds which do not roost in trees fall a more or less easy prey to the fox. The full-grown emu, of course, is able to defend itself against a fox—at least, I have not yet heard of any being killed by foxes. But the young ones are constantly taken. The lyre-bird, which is a slow breeder, and is steadily being driven back by civilization, is one of the fox's most easy victims. The wild turkey, another shy breeder, is constantly being killed by the fox. In these and many other cases the habit of doing his hunting by night—which is always the practice of the fox—helps him greatly. The wild turkey is sitting on her solitary egg, on the bare ground, when the fox, after an easy stalk, pounces upon her. After killing her, he disposes of the egg. At one time a large number of these fine birds used to nest on our open western plains. Now a nest is a novelty, and a station manager, who has spent most of his life on the plains, told me lately that almost the whole of the responsibility for this sad state of affairs rested on the fox. Time and again, while riding over his estate, he has come upon the mangled remains of nesting birds. A heavy toll is also taken of the eggs of the smaller ground-building birds, such as the quail and plover, and the young of hundreds of these birds are also eaten.

It would perhaps be thought that the water-fowl would be safe from molestation, as the fox has no love for water. But his hunting instinct has been able to overcome even this difficulty. The native companion, as a rule, nests on an island in a lake, or on a piece of rising ground in a swamp. There she lays her two large eggs. But the fox doesn't mind the water-logged rushes that lie between him and his prey, and so the nest of this fine bird is broken up and the eggs devoured. The swan nests in the rushes and the reed-beds of the lakes, lagoons, and swamps, and sometimes in a clump of reeds in a quiet river bend. She lays from four to six, or even eight, eggs in a clutch, so that a swan's nest is a regular windfall to a fox. Prowling about night after night, he is so active and energetic that very little escapes his notice. Not only will he wade amongst the reeds, but, if the occasion demands it, he will also swim. I know of a large reed-bed in a lake that is always completely surrounded by about three

feet of water. This reed-bed is a favourite nesting-place of swans and other wild-fowl. A few months ago a stockman, who waded in to find a swan's nest, was amazed, when he found the nest, to see a fox curled up in it. He had eaten the eggs, and was taking a well-deserved sleep. The fox at once sprang into the water and swam for the land, where, fortunately, an eager hound was waiting for him.

A favourite occupation of the fox is to stalk ducks and swans and geese around the margin of a lake or creek. One moonlit night not long ago a duck-shooter, who was camped at the side of a lake waiting for the ducks to come in, suddenly noticed a fox stealing cautiously down to the water. The fox kept low in the grass and crept very slowly along. His eyes were all the while on the water, and the reeds that fringed it. When he got to the margin of the lake he crept cautiously along. As this happened to bring him within easy range of the sportsman, a charge of shot settled one poacher. The sportsman then found the mangled remains of three ducks along the lake shore. Judging from the remains found at the earths of foxes in the Western lake country, the *menu* of the fox consists chiefly of hare and swan. Both the swan and the hare are very plentiful, but it is certain that large numbers are killed by foxes. The Cape Barren goose, which visits these plains every summer, is another of the fox's victims. This goose does not go out into deep water, like the ducks and swans, but stays in the shallows, so that it often falls an easy prey to the fox. It is said that it sleeps standing on one leg, in the water, and that the fox thus cannot scent it. But I am prepared to back the fox to either see or smell this large bird, especially on moonlit nights. It happens, however, that the Cape Barren goose is a very shy and wary bird, so that it is one thing to see it and quite another to catch it. This fact probably protects it to some extent against the fox.

Incomplete as it is, the above list, it must be admitted, forms a very heavy indictment. And, although in isolated districts something is being done to prevent the increase of the pest, over huge areas the fox is being allowed to pursue his work of devastation practically unmolested. The fact that most of his nefarious work is done at night gives him two great advantages—it is unseen, and it is uninterrupted. During the day the fox, for the most part, keeps to the cover, and is only seen by the early-rising bushman when stealing home in the early dawn after a night's hunting. The fox has the further advantage of being too swift-footed and cunning to be caught by the average dog, and of being too large and strong to be killed by the average shot. All these facts, while they place difficulties in the way of his destruction, at the same time call loudly for more energetic and more systematic efforts to keep him in check.

THE WAIPOUA (N.Z.) KAURI FOREST. — The New Zealand Department of Lands has recently issued another of Dr. Cockayne's valuable reports, this time on the Waipoua Kauri Forest, situated near the west coast of the North Island, about 110 miles north-west of Auckland and 10 south of Hokianga Harbour. The report is on similar lines to that on Kapiti Island, noticed in these pages some time ago, but, entering into more minute details, is even more interesting. The area under notice covers about 23,000 acres, and, while termed a Kauri forest, is far from being covered to any great extent by that tree, and, in fact, the Tarairi, *Beilschmiedia tarairi* (Lauraceæ), is a more frequent tree; still, the forest contains many fine Kauris, *Agathis australis*, and the author considers that the area should be absolutely closed to timber-getting, for, as he points out, unless this is done, a Kauri tree will be as rare as a Moa in New Zealand in less than twenty years. It is hoped, for the benefit of future botanical students, that this will be done, and especial care taken of the area to prevent fire undoing all the work of legislation. Dr. Cockayne's report is interesting from the way in which he considers the varied aspects of the different plant associations, and he concludes by saying that if allowed to be invaded by timber-getters there will pass away from the face of the earth a scene that will never be replaced, and while such fiords, glaciers, and hot lakes as those of New Zealand occur in other parts of the globe, nowhere else does a Kauri forest exist. Hence, if only for the sake of future generations, it should be preserved. The report contains a number of beautiful and characteristic illustrations, which give a splendid idea of the vegetation, while a complete list of the flora, amplified by notes on the distribution and life-form of the species, with English and Maori names, is given. In all, 241 species are recorded. A useful bibliography and map complete the report.

ALGÆ OF THE YAN YEAN RESERVOIR.—In the *Journal of the Linnean Society* (London)—Botany xxxix. (1909), pp. 1-88—Professor G. S. West, D.Sc., F.L.S., has published an exhaustive illustrated report on the algæ of the Yan Yean Reservoir, which is important from the fact that it is the first plankton investigation of Australian fresh waters. The report is based on the monthly examinations of the reservoir and its surroundings, made by Mr. A. D. Hardy, F.L.S., who has recently been appointed honorary algologist to the Metropolitan Board of Works. Prof. West says the phyto-plankton of the reservoir is rich both in number of species and individuals. Its desmid-flora is also rich, and in this respect compares well with British lakes. Over 300 species of algæ are recorded from the Yan Yean drainage area. Of these 14 species and 11 varieties are described for the first time, and 4 species and 5 varieties, previously only partially described, are now dealt with in greater detail, and figured for the first time.

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FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 13th September, 1909.

The president, Prof. A. J. Ewart, D.Sc., occupied the chair, and about 70 members and visitors were present.

REPORTS.

A report of the excursion to Bayswater on Saturday, 14th August, was given by the leader, Mr. C. F. Cole, who reported a fair attendance of members. Owing to the cold, wet weather, the season was very backward, so that only a few of the commoner species of birds were seen. Several partly constructed nests of the Yellow-breasted Shrike-Robin were observed. A few plants were noticed in bloom, but they were only the usual early spring species.

A report of the excursion to Warrandyte on Saturday, 28th August, was given by the leader, Mr. G. Coghill, who reported an attendance of nearly 50 members and friends, notwithstanding the very inclement weather at the time of starting. The party travelled from town in three large motor-cars, and though a little late, owing to the wet roads, reached Warrandyte without mishap. Afternoon tea was then taken, after which members had time to visit the river banks and admire the Silver Wattles in bloom. Unfortunately, owing to frost and rain during the previous days, the wattles were not so fine as usual. Little collecting could be done, owing to the scrub being so wet; however, the orchids *Pterostylis pedunculata*, *P. nutans*, *P. curta*, *Corysanthes pruinosa*, and *Acianthus exsertus* were recorded. In addition to *Acacia dealbata*, *A. acinacea*, *A. diffusa*, and *A. pycnantha* were noted in bloom.

A report of the excursion to Sandringham on Saturday, 11th September, was given by Mr. J. A. Leach, M.Sc., who acted as leader in the unavoidable absence of Dr. Sutton. He reported a fair attendance of members, and that a good collection of the usual spring flowers was made. Some attention was given to the numbers of sea-birds in the bay at present, and great interest was taken in the diving of the terns.

A report of the junior excursion to Fairfield on Saturday, 4th September, was given by the leader, Mr. J. S. Kitson, who reported a good attendance of juniors. Attention was directed to the geology and geography, the animal (pond) life, and the plant life of the district, and short demonstrations given under each heading.

The hon. librarian acknowledges the receipt of the following donations to the Library:—"Transactions of Natural History Museum, Hamburg," vol. xxv., from the Director; "Bulletin of the American Museum of Natural History," vol. xxv., part 1, from the Museum; "The Wilson Bulletin," December, 1908, from the Wilson Ornithological Society, Oberlin, U.S.A.; "Proceedings and Transactions Nova Scotian Institute of Science," vol. xi., parts 3 and 4, and vol. xii., part 1, from the Institute; *The Brazilian Entomologist*, June and August, 1908, from the editor; *Knowledge*, November, 1908, from the publishers.

ELECTION OF MEMBERS.

On a ballot being taken, Mr. Edgar Handley, 74 Park-street, North Fitzroy, was elected an ordinary member; Miss L. Parkinson, 12 Johnson-street, Glenferrie, an associate member; and Miss Nestor Smyth, Master Ponsonby Smyth, 36 Park-street, South Yarra; Miss Edith Steel, 37 Leopold-street, South Yarra; Master Leslie Dennis, Walker-street, Northcote; Master Horace Fullard, Gillies-street, Fairfield; and Master E. Potts, Cotham-road, Kew, as junior members of the Club.

GENERAL BUSINESS.

Mr. A. J. Campbell gave notice that he would move at the December meeting:—

1. "That this Club take some action to prevent the stripping of bark from the Silver Wattles on the Yarra banks, particularly between Heidelberg and the neighbourhood of Eltham."

2. "That this Club aid in the promotion of a 'National Wattle-day.'"

PAPERS READ.

1. By Mr. J. A. Kershaw, F.E.S., entitled "Additions to the Fish Fauna of Victoria, No. 2."

The author recorded the occurrence for the first time in Australian waters of an extremely rare deep-sea fish, the Crested Band-fish, *Lophotes cristatus*, Johnson, recently received by the National Museum. The specimen, which measures a little over 4 feet in length and only $1\frac{1}{2}$ inches in thickness, was captured in shallow water about 20 miles east of Apollo Bay, on the Victorian coast. The fish, a photograph of which was exhibited, is remarkable in shape, the head being abruptly elevated in a high crest, on the extreme anterior angle of which is a long, flexible spine, 9 inches in length, the body tapering off to the very narrow tail. This remarkable species was previously recorded from the island of Madeira, in the Atlantic, and its occurrence on our coast is believed to have been due to recent heavy storms.

2. By Mr. A. J. Campbell, Col. Mem. B.O.U., entitled "Wattle-time, or Yellow-haired September."

The author, in an interesting paper, drew attention to some of

the more prominent species of Australian acacias, giving some particulars of their habit of growth, time of flowering, &c., and illustrated his remarks with a series of lantern slides showing typical specimens of each species.

The paper gave rise to some discussion, in which the chairman and Messrs. Pitcher, Hardy, Coghill, C. J. Gabriel, and Barnard joined.

EXHIBITS.

By Mr. R. W. Armitage.—Specimens of a Sea-pen, or Pennatulid, from the island of Sudest, near New Guinea.

By Mr. A. J. Campbell.—Blossoms of acacias, in illustration of paper.

By Mr. C. French, jun.—Specimen of *Epacris impressa*, 9 feet in height. This plant is probably the tallest ever recorded, and was growing amongst tea-tree at Bayswater, 9th September.

By Mr. C. J. Gabriel.—Rare marine shells—*Voluta kreuslerae*, Ang.; *V. verconis*, Tate; and *V. fulgetrum*, Swain., from South Australia; also varieties of *Chlamys glaber*, Linn., from the Mediterranean.

By Mr. A. D. Hardy, F.L.S.—Fruit specimen of the Mistletoe, *Loranthus pendulus*, found growing on a Swamp Gum, *Eucalyptus gunnii*, at Kew.

By Mr. H. W. Jeffery.—Marine shells—*Triton chlorostomus*, Lam., from Hilo, Hawaii; and *Potamides sulcatum*, Born., from Yule Island, New Guinea.

By Mr. J. A. Kershaw, F.E.S., for National Museum.—A photograph of rare fish, *Lophotes cristatus*, Johnson, in illustration of paper.

By Mr. F. Pitcher.—Blossoms of Victorian acacias grown at Melbourne Botanic Gardens—*Acacia acinacea*, Lindl.; *A. juniperina*, Willd.; *A. leprosa*, Sieber; *A. longifolia*, Willd.; *A. lunata*, Sieber; *A. montana*, Benth.; *A. oxycedrus*, Sieber; *A. pravissima*, Cunn.; *A. pycnantha*, Benth.; *A. sclerophylla*, Lindl.; *A. verniciflua*, Cunn.; and *A. verticillata*, Willd.

After the usual conversazione the meeting terminated.

BIRD DAY.—The Hon. the Minister for Education has directed Friday, 29th October, to be set apart as Bird Day throughout the State schools, and we hope the idea will be taken up by the private schools and colleges also. The *Education Gazette and Teacher's Aid* for September contains the details of the programme to be carried out. It has been suggested that a league be established among the pupils, to be called "The Gould League of Bird-Lovers," as a means of fostering a love for the birds around them. In the same number of the *Gazette* Mr. J. A. Leach, M.Sc., continues his illustrated articles on the Victorian birds, dealing with the ground-birds, thrushes, chats, and honey-eaters, giving figures of nearly fifty species.

IN THE HEART OF THE MALLEE.

BY A. H. E. MATTINGLEY, C.M.Z.S.

(Read before the Field Naturalists' Club of Victoria, 9th Aug., 1909.)

THE frequent descriptions of the bird-life to be found in that part of Victoria known as the Mallee which had appeared from time to time in the "Nature Notes" column of the *Argus* from the pen of "Mallee-Bird," otherwise Mr. Chas. M'Lennan, since appointed ranger of the National Park, Wilson's Promontory, whetted the ornithological appetites of my friends, Mr. J. Ross and Mr. F. Howe, as well as my own. We therefore decided to visit the Pine Plains district, from which Mr. M'Lennan had so often drawn his pen-pictures.

To my friends the Mallee was a *terra incognita*, and both were anxious to see the peculiar animal and bird life of the scrubs and arid sandy wastes which they were under the impression comprised that region. As for myself, I had been in "Mallee" country before, and knew what to expect. Our leader, Mr. Ross, thinking that the scrub was only a few feet high, and that climbing irons and rope ladders would be so much superfluous baggage, decided that those useful adjuncts for studying bird-life should be left behind, and greatly we regretted it afterwards.

Arrangements were made with Mr. M'Lennan to meet us at Hoptoun, which is rather more than 250 miles north-west of Melbourne. We accordingly left town by the morning train on 13th September, 1907, and reached our destination just before midnight, after a long and dreary day's travelling, punctuated by stoppages more or less dreary at numerous wayside stations.

At one of these, Murtoa, we found we had time for a short stroll, so, espying some Buloke trees, *Casuarina luehmanni*, about a mile away, we reckoned they would doubtless provide food and shelter for some of the local birds, and made for them. We were not mistaken, for we found nests containing young of the Black-backed Magpie, *Gymnorhina tibicen*, the Raven, *Corone australis*, and the White-faced Xerophila, *Xerophila leucopsis*, whilst a Red-capped Robin, *Petroica goodenovii*, and a Yellow-rumped Tit, *Acanthiza chrysorrhoa*, were observed building their dainty nests, that of the former being an open cup-shaped nest, while the tit's nest was a domed-over structure three times the size of the robin's. Among the other birds flying about here were the Wood-Swallow, Galah (Pink-breasted Cockatoo), White-fronted Chat, Musk Lorikeet, Grass-Parrakeet, Ground-Lark, Noisy Minah, Laughing Jackass, or Giant Kingfisher, and Kestrel.

Returning to the train we resumed our journey, and without further incident, except a sudden stoppage of the train, which

brought the luggage tumbling from the racks, duly arrived at Hopetoun, and sought out a hotel. Up betimes in the morning, we had a look round the township, and were surprised to see a fine sheet of water on the outskirts of the town, which we forthwith visited, and found it to be several feet deep and containing excellent fresh water—in fact, it was the town's water supply. This was one of the many surprises we were destined to meet with, for our preconceived idea of this portion of the Wimmera district took the shape of a howling wilderness, a good-for-nothing desert.

As was but natural, bird-life was plentiful about the lake, which is known as Lake Koorong. In some eucalypts growing along the margin of the lake we found the nest of a Mud-Lark, *Grallina picata*, containing three young birds. Out on the open water Black Swans, Black Ducks, and Coots were plentiful, whilst the Marsh Terns, in their white plumage, flickered over the lake, betokening the presence of fish fry in the waters below. The White-fronted Heron, *Notophox novæ-hollandiæ*, the Little Egret, *Garzetta nigripes*, and the Black-fronted Dottrel, *Egialitis melanops*, patrolled the shallows, and searched for water insects and crustacea. Those alert, graceful birds, the Tippet Grebes, *Podicipes cristatus*, were also seen, as ever and anon they eclipsed themselves when diving after their prey, then as suddenly there was a flash of iridescent white as their pearly breasts emerged once more from the water. So quickly do they disappear on the approach of danger that it is not difficult to believe the story told of their ability to dive out of harm's way on seeing the flash of a gun before the shot reaches them.

The full and rounded, richly melodious note of the Harmonious Thrush resounded through the trees, whilst the White-plumed Honey-eater, *Ptilotis penicillata*, the Spiny-cheeked Honey-eater, *Acanthochera rufigularis*, and the Black and White Fantail, or Shepherd's Companion, *Rhipidura tricolor*, kept up an incessant twittering as they searched the trees for insects. Overhead the Whistling Eagle, *Haliastur sphenurus*, and the Wedge-tailed Eagle, *Uroæetus audax*, soared around on the look-out for their furred or feathered victims.

On returning to the hotel for breakfast we found Mr. S. Poulton, the owner of Pine Plains station, waiting for us with a buggy and pair of horses, so we drove out some 10 miles to the head station, Camba-Canya. As we drove along a first-class road, bordered on either side by scattered, stunted eucalypts and Needle-wood Trees, *Hakea leucoptera*, all that was left of the once dense mallee, now replaced by wheat-fields, we noticed the Brown Tree-creeper, *Climacteris scandens*, the Brown Flycatcher, *Pseudogerygone fusca*, the Rufous Song-Lark, *Cinclorhamphus rufescens*, and the Black-breasted Plover, *Zonifer tricolor*. A pair of Mountain

Ducks, *Casarca tadernoides*, were seen feeding in a depression filled by the waters of the irrigation channel, which, by the way, draws its supplies from Lake Lonsdale, far to the south, near Stawell. Along this channel a Pacific Heron, *Notophoxyx pacifica*, was observed as it diligently policed the banks on the outlook for those earth-boring crustaceans commonly known as "yabbies." These creatures pierce the banks of the channels, and so allow the water to escape, hence the herons are the irrigationist's friends.

Approaching Camba-Canya we drove through a number of the graceful Murray Pines, *Callitris robusta*, growing upon slight elevations. Along the bases of some of these elevations we noticed numbers of small white mounds, known locally by the native name "Copai." These mounds are quite devoid of vegetation. Gypsum is to be found in many places, whilst outcrops of limestone or desert sandstone are not infrequent. We were hospitably received at the homestead, which is substantially built of limestone and bricks, and with numerous outbuildings forms quite a small settlement. Shearing was in full swing, while in another direction a number of men and teams were engaged in excavating a huge tank in which to store water from the channel for summer requirements.

With a fresh pair of horses and the buggy piled high with our luggage we set off, without a guide, on what we were told was a 35-mile drive to Pine Plains, in the heart of the Mallee. The additional information that the road would be sandy and the travelling slow we soon found to be only too true, and we had hardly left the homestead paddock when our road became a mass of soft, fine sand, interspersed with the roots of the mallee, the stems of which had been cut off level with the surface of the ground. The consequence was that the vehicle bumped about fearfully, and the horses had a hard struggle to get along with their load. After a few miles of this soft, sandy road, two of us decided to walk and save the horses as much as possible. We soon out-distanced our vehicle, and, as we passed along the bush track through typical Mallee scrub, we would occasionally startle a White-eared Honey-eater, *Ptilotis leucotis*, or hear the twittering of a Chestnut-rumped Tit, *Acanthiza reguloides*. A nest of a Spiny-cheeked Honey-eater, *Acanthochara rufigularis*, containing two eggs, was found near the edge of the track, situated in a tangled mass of the smaller Clematis, *C. microphylla*, and being constructed of green-coloured grass and twigs, was almost invisible. In fact, had it not been for the bird flushing out as we passed we would never have known that the nest existed.

Here and there the pug of a kangaroo's foot was discerned in the soft sand, whilst several species of lizards, aroused by our

approach, scuttled across the track. A hasty snap was taken of a Jew Lizard, *Gramatophora barbata*, Kaup., basking on a dead Mallee stem. One of the smaller lizards was of a beautiful green, marked with yellow. In a small depression along the track, where water sometimes accumulated, several box-trees had found a suitable soil in which to grow, and in the top of one a pair of Wedge-tailed Eagles had built their large, platform-like nest of sticks. Rabbits seemed to be absent from this part of the country—at least, none were seen as we passed along.

Suddenly, on crossing a rise, the road dipped into flat country, which was dotted for several miles with larger eucalypts; these were the homes of a greater variety of birds than we had hitherto seen. Several elongated plains intersected this country, and around their margins huge Red Gums, *Eucalyptus rostrata*, reared their umbrageous heads. We were in the ancient bed of the Wimmera River, where it had years ago spread out its arms and become lost in its vain endeavour to reach the Murray River.

Presently we came to some rising ground on which was situated an iron hut, used as a camping place by the men when droving sheep and cattle between the outlying stations. Several tanks of fresh water for domestic purposes were here, whilst a well of semi-brackish water yielded a never-failing supply for the stock. This place is known as Wonga. We decided to spell here for an hour or so, and rest and feed our horses. In the meantime we had a good look round the surrounding country, which is known as the Wonga Basin, and would form an admirable national park without any further making. Flowering shrubs abound, principally Acacias, Hakeas, and Grevilleas, whilst the Quandong, or Native Peach, is to be found in many places. Several tea-trees and heaths occur among the smaller shrubs, and the air was balmy and redolent of the aromatic odours of the pines, eucalypts, and the fragrant shrubs. The ridges, covered with tall, graceful pines, were intersected by verdure-clad bays or indentations forming the plains, the green sward of which, clear of all other vegetation except grass, patterned themselves into fantastic arrangements. Patches of typical mallee intervening lent a decided charm to the spot, while in every direction the old river-beds were overshadowed by picturesque Red Gums. Areas of open country were frequently met with, and places which had once been the beds of lakes were ready-formed recreation grounds as level and as green as a billiard table.

Mobs of emus and kangaroos freely dotted these places, whilst back in the mallee thickets the wonderful nesting mounds of the Lipoa or Mallee-Fowl were numerous. Pigeons and cockatoos swarmed in this as yet undisturbed country, and many

species of honey-eaters were observed ravishing the eucalyptus and other blossoms for their nectar. Flocks of Galahs, which find homes in the numerous hollow spouts of the gums, flew away when disturbed by our investigations, their pink breasts appearing as if the blooms of a rose garden were being blown through the air. Gay-caparisoned parakeets were everywhere, also Choughs and Babblers, whilst the Wedge-tailed Eagles could be seen soaring overhead. Magpies could be heard carolling in the trees. Several varieties of blue-wrens flitted through the polygonum bushes, delighting the eye with the colour of their lovely plumage, whilst quaint Emu-Wrens hopped saucily through the spinifex. The wailing call of the Curlew, or Southern Stone-Plover, weird and shrill, broke the stillness of the night, and as the wind swept sobbing through the pines it carried with it the call of the Mopoke. The whole place is a perfect paradise for nature lovers, and in view of its probable early opening up for settlement, Wonga Basin, along with Brambrook and the adjoining Jerriwerrup (locally called Cherry-whip), should certainly be reserved. The prevailing cloudless sky and the dry atmosphere of the district mark it as a future sanatorium—one of the lungs of the city, so to speak. Brambrook derives its name from a horse the notorious bushranger Morgan used to ride, and which he left at this place, one of his bush fastnesses. Everlasting flowers grow to perfection on the sand-ridges, and were ten or twenty thousand acres of this country set aside as a national park, it would be a most valuable heritage for future generations of nature students. Meeting this class of country in what we had mentally pictured as a wilderness gave us a surprise, but at the same time infinite pleasure.

Tradition has it that there is a ghost at Wonga. When the hut was first erected a shepherd was stationed there. One day he suddenly appeared at the head station in an exhausted condition, and, when questioned upon his hasty return, said that a woman had been murdered the night before. Asked if he had seen the woman, he said no, but he had heard her agonizing screams. There is no doubt that the noise was made by a Delicate Owl, *Strix delicatula*, as this bird at times emits a blood-curdling screech. As the woman's body was not to be found, the man maintained that it must have been the ghost of a murdered woman, and nothing would persuade him otherwise. The Night-Parakeet, *Geopsittacus occidentalis*, used to be seen by the aboriginals at Wonga years ago. It lays five to six eggs, in the spinifex.

Immediately after leaving Wonga Basin we struck heavy sand again, and the buggy driven by Mr. Ross was soon left behind, and we did not see it again until midnight, when it reached Pine Plains station, where we had arrived nearly two hours before.

Darkness came on soon after we left Wonga, and a deathly stillness pervaded the air. The sky was presently lit up by the pale moonbeams, and, as we made no noise in tramping along in the soft sand, the stillness had a lonely, dispiriting effect, accentuated further by an occasional wailing cry from a Curlew. Frequently my companion would ejaculate—"Here is Pine Plains!" as he saw a white sand dune show up in the distance through the tall timber. The white sand appearing like open country ahead gave him the impression of an open plain.

After many such false alarms we came to another hut and well for watering stock, known as "Bracke;" by this we knew we were on the right track, so, hastening forward, in a few more miles we came suddenly upon plain country, where the ground was hard. Sounds of a horseman appeared to be coming towards us, and presently Mr. M'Lennan rode up. He had become anxious as to our whereabouts, as we were hours behind time, and had set out to look for us. Having set us on the way, he hurried on to meet the buggy, which he found five miles behind, Mr. Ross having got temporarily bushed. We were not sorry to reach the homestead after our 35-mile tramp along the sandy track, and did ample justice to a sumptuous repast set before us by the married couple in charge, who treated us right royally throughout our stay.

We spent the first day exploring the open paddocks around the house, which is situated on the top of a high sand-ridge, from which we could see in every direction for many miles. A fine crop of wheat, to be used as fodder, grew close by, while a well-kept vegetable garden supplied many a welcome addition to our meals. Fine grass-lands abounded on all sides. There were miles of country without a trace of Mallee; large plains without a vestige of timber, evidently the dried-up beds of ancient lakes, were fringed with picturesque Red Gums, whilst graceful Murray Pines grew profusely on the sand-ridges. Box-tree flats intervened, and as the trees had been rung for some years, innumerable hollows had formed in the trunks and branches, which were tenanted by cockatoos and parrots of many species. As we passed by we tapped the tree-trunks with a stick, when out would fly the occupants. The Many-coloured Parrakeet, *Psephotus multicolor*, with its Jacob-like coat of many colours, and the Pink or Major Mitchell Cockatoo, *Cacatua leadbeateri*, whose discordant notes were in marked contrast to its beautiful plumage, were flushed from the larger hollows. Several Sulphur-crested Cockatoos, *C. galerita*, Orange-tipped Pardalotes, *Pardalotus affinis*, and Tree-Martins were unceremoniously disturbed when we tapped the trees in which they had nested. Our leader looked rather glum owing to the climbing irons having been left behind, and as I was the climber of the trip, and my companions

were eager to see all that they possibly could, I had to forego the opportunity of obtaining photographs of the parrot family in their homes, and offer my services for climbing.

Galahs, *Cacatua roseicapilla*, were frequently met with, and in all cases the hollows in which they nested were lined with a thick pad of eucalyptus leaves. Our guide led us to a bower of the Spotted Bower-bird, *Chlamydodera maculata*, and a photograph of it was taken. The bower was a small one; at either end was a collection of bleached bones, whilst pieces of old china and broken glass were the brightest objects these birds had gathered to decorate their play-ground. The Bower-birds are becoming rare in the Mallee now.

Next day we set out over the plains and across the pine-clad ridges to the edge of the scrub, my companions driving, with Mr. M'Lennan as guide, while I rode a good-tempered stock horse, which remained quite still while I stood up in the saddle to examine the hollow spouts of the trees deserted by the numerous parrots as we passed along. We went some miles along what is locally known as the Dingo Pad, and found the scrub inhabited by many varieties of birds. A nest of the White-throated Thick-head, *Pachycephala pectoralis*, was found containing two eggs, also a nest of the Red-throated species, *P. gilberti*, containing the same number; both were built in dwarf pines, and were just such structures as built by the thickheads around Melbourne. A pair of Chestnut-rumped Ground-Wrens, *Hylacola pyrrhopygia*, were seen rounding up their newly hatched family of three in order to get it out of harm's way. The tinkling, bell-like notes with which the Crested Oreoica or Bell-bird, *Oreoica cristata*, finishes its call were frequently heard. Next, the excited actions of a pair of Scrub-Robins, *Drymaedus brunneopygius*, evidenced our proximity to their offspring, and after some trouble we found it concealed in some *débris*. After waiting some time in concealment a snap-shot was secured of the old birds succouring their single young one.

The nest of another Scrub-Robin was found by Mr. M'Lennan, who knows the habits of these birds thoroughly. It was a simple cup-shaped structure of sticks and small twigs let into the ground, and contained a solitary egg, the usual clutch of this bird. Our guide has nicknamed this bird "the trapper's companion" on account of its inquisitiveness, sociability, and fearlessness when he has been out quietly setting traps for Dingoes and other vermin. They are fairly tame so long as no noise is made, but directly they hear a sound they disappear at once, only to reappear when all is still again. Sometimes the nest is built amongst the bark or *débris* at the base of a mallee bush, and at times is situated quite 18 inches from the ground. When returning to the nest after having been frightened these birds adopt a

PLATE I.



FIG. 1.

PINES, WONGA BASIN.



FIG. 2.

PINES AND TALL MALLEE.

Photos. by Mr. A. H. KENYON.

coquetting action, approaching within a yard or two of it then rapidly darting away into the scrub, only to repeat the same performance immediately afterwards. One has only to possess a little patience and keep quiet and the Scrub-Robin will show exactly where the egg or young one, as the case may be, is located.

Having taken a series of photos. of the Scrub-Robin, we proceeded to the nesting mound of a Lipoa, or Mallee-Fowl, *Lipoa ocellata*, which Mr. M'Lennan had thoughtfully marked down for us. All were eager to examine it, and my companions were wildly excited, since it was their first introduction to the nesting habits of these wonderful ornithological enigmas. This mound, together with several others which we afterwards investigated, greatly enlarged my knowledge of the Lipoa, and helped me considerably in my monograph of the bird published in *The Emu* (vol. viii., page 53), in which further details may be found. On our way back to the homestead several honey-eaters, which could not be identified, were seen flitting through the stunted banksias, whilst the mouse-like hole forming the nesting burrow of the dainty Golden-rumped Pardalote, *Pardalotus xanthopygius*, was examined, and found to contain four white eggs, cradled in a rotund nest of bark and fibre situated at the end of the burrow, which was about 18 inches in depth.

The following day we started to follow the Patchewollock Pad, and while driving through the home paddock we noticed a pair of Wedge-tailed Eagles apparently tearing a lamb to pieces and feasting upon it. An expectant circle of Ravens surrounded the eagles, but keeping at a respectful distance of about 15 yards, as they waited in readiness to secure any scraps which the eagles might overlook. Driving rapidly up in the buggy, the birds rose and flew a short distance away to await our retirement. Examination showed that they had killed a large white domestic rooster which had boldly engaged them in combat so as to protect the hens. One of the station hands informed us that he had laid poison for the eagles, and had destroyed over 200 in the course of a year. Remonstrance seemed useless in a case like this, but the large amount of good done by eagles in destroying vermin, which more than counterbalances the harm done, was not sufficiently convincing to the people living in this district. The largest bird destroyed measured over 9 feet from tip to tip of extended wings. It may be mentioned that our Wedge-tailed Eagle, *Uroaëtus audax*, often called Eaglehawk, is the largest true eagle in the world, and specimens have been taken measuring more than 10 feet across the wings.

Our track passed close to a well-known land-mark of the district, Mt. Jenkins, situated about long. 142° E. and lat. 35½° S. It is a pyramidal hill of sand rising about 150 feet above the

plain, and is one of the highest elevations of that part of the country. A couple of Mallee-Fowls' nests were visited and searched, one of them containing two eggs. A nest of the Chestnut-rumped Ground-Wren was found carefully hidden in fallen bark at the base of a Mallee bush, and contained three typical rich brown eggs. A Scrub-Robin's nest with the usual one egg was also found, but though a Chestnut-backed Ground-bird, *Cinclosoma castanonotum*, was seen running over the sand through the scrub, and a diligent search was made, no nest could be found. Fresh tracks of Dingoes were noticed, and several skeletons of these marauding creatures were seen, the remains of animals cast aside by the trappers. A few kangaroos were seen feeding in an open glade, and hopped jauntily along some distance in advance of us. Several Choughs' nests containing young birds were seen, as well as those of the White-browed Babbler, *Pomatorhinus superciliosus*, both useful insectivorous birds. As the country is almost waterless at this spot the Choughs must have had some difficulty in building their mud nests; to do this they probably regurgitated enough saliva to make the mortar sufficiently plastic for the purpose, while it was further strengthened by the use of grass-stems, which the birds intermix with the mud before cementing it into a solid mass. A remarkable fact about these mud nests is that they are always built with a larger diameter at the top than at the bottom, thus protecting the foundation of the nest from destruction by rain, which if it were not for the larger rim would be quite exposed to the elements.

The next day, the 18th of September, found us on the way for the Heath Pad. These "pads," or rather bridle tracks, are made by causing a horse to drag a log through the scrub, thus crushing it down, and after being formed remain visible for some time. Along them the Dingoes are wont to roam, and there the Dingo-hunter usually sets his traps in the sand underneath the track, so that any of these wandering enemies of the squatter's sheep may be caught. Another method is to doctor a bush with oil of rhodium, and then set the traps in the sand close by. The Dingoes come sniffing round the bush and step into the hidden trap. The best lure, however, is the contents of a Dingo's bladder, for it is a fact not generally known, and which bears on the scientific affinity of the Dingo to the ordinary domestic dog, that it loves to micturate on the spot where another of its kind has performed the same act. Dingo traps are huge steel affairs, weighing many pounds. They are never fastened to a stake because the animal would twist its leg off and escape on the remaining three if this were done. As it is the traps, some 8 or 10 lbs. in weight, are often dragged 7 to 10 miles away from the spot where set, until the animal becomes exhausted. Owing to

the enormous distances to be traversed by the trappers along these pads, the traps are visited about twice a week, and when a trap is found missing it has to be tracked over the country until found, and so expert are the hunters that one is rarely lost. One has to be careful in traversing the pads, because the traps are very strong, and it is very difficult to release one's leg if caught in the jaws. It is, therefore, customary to fix a branch up in a bush overhanging the trap as a warning to passers-by.

In the open country, before we reached the pad, the excited actions of some Black-breasted Plovers informed us that their young were not far away, and as we approached two large young birds scampered off. After running a little distance they crouched on the ground, when their black plumage harmonized so closely with the surrounding objects that it was most difficult to detect them. In the top of a box-tree a Wedge-tailed Eagle had built its nest, and on climbing up a solitary eaglet was found; it was covered all over with a coat of pure white down, and formed a pretty object. Contrary to the usual idea, these eagles are great cowards, and will desert a nest if anybody approaches within a quarter of a mile of it.

Several nests of the Graceful Honey-eater, *Ptilotis ornata*, were also found, while many Spiny-checked Honey-eaters were seen feeding in the tree-tops. Restless Flycatchers, *Sisura inquieta*, and Red-capped Robins, *Petroica goodenovii*, were also seen, busily engaged building their nests. Evidence of the presence of Emus, indicated by tufts of feathers, were seen in many places. Unharnessing our horses, we fastened them up, and then went for a long tramp over sand dunes covered with pines and scrub. The pad led us to a beautifully green oval space of about ten acres, named by Mr. M'Lennan "the Dingoes' recreation reserve." Here we espied a fox, and presently a Dingo. Probably both of these have by this time yielded their scalps to our guide, who claims to have accounted for the deaths of close on 3,000 Dingoes. Several Mallee-Fowls' nests were inspected, and additional notes on the habits of other birds were made. Many Chestnut-rumped Ground-Wrens were seen in this part.

On returning to the buggy we found the horses had broken away and returned home, so there was nothing else to be done but tramp home. Fortunately the saddle-horse had not disappeared, so, as I had done most of the hard work in climbing and had carried a heavy camera all day, my companions decided that I should ride home. So off I started, with my impedimenta slung around me, and, though it was now dark, reached the slip-rails of the home paddock without mishap, and found the two buggy horses waiting to be let in.

The following morning there was a muster of drovers and

stockmen, and, in addition, a small band of explorers, whom Mr. Poulton was sending out to see if any good grass land and water existed further afield, for Mr. Poulton is the lessee from the Victorian Government of many thousands of acres of unoccupied land in the north-western part of the State. After photographing a group of the men, we drove out to a locality known as Cape Horn to see more Mallee-Fowls' nests. A White-eared Honey-eater's nest with two eggs was seen, and a pair of Black-backed Wrens, *Malurus melanotus*, were building a nest.

Further on we came to a fine grazing area known as the Wirren-gren Plain. This has an irregular boundary of about twenty miles, and is the dried-up bed of an inland sea, with its bays, inlets, promontories, &c., each named by the station hands for convenience in directing the movements of stock. Miller's Tank, Stuart Island, Sleeping Point, and Toy's Look-out are some of the names which occur to me. This vast plain, which when we saw it was well grassed and verdant in the extreme, seems to have been the farthest point in this direction to which the Wimmera River had been able to penetrate. A White Cockatoo was seen leaving a hollow in one of the largest Red Gums on the edge of the plain, and several Galahs were flushed from the same tree. As we drove along parrots and cockatoos kept flushing out of the hollows in every direction, while an occasional Yellow-tipped Pardalote, *Pardalotus affinis*, would dart out, and after a time utter its peculiar note, "Whit-e-chew." A flock of Black Cockatoos, *Calyptorhynchus funereus*, numbering at least one hundred and fifty birds, were disturbed as they were feeding on the soft, nutritious seeds of the Wallaby Grass, *Danthonia penicillata*, and of the "Nardoo," *Marsilea quadrifolia*. As they flew away in their usual heavy, laboured way, the yellow colour of the ventral surface of their tail feathers showed conspicuously, in marked contrast to their otherwise sombre hue.

Driving by a dam known as Miller's Tank, we disturbed vast numbers of Galahs that had come there to drink. Bronze-winged Pigeons also frequent the tank, and arrive in large numbers just at sundown. This habit renders them an easy prey to the pot-hunter, and steps should be taken to secure their protection. Among other birds noticed here was the Black-eared Cuckoo. Close to the tank a pair of Wedge-tailed Eagles had built a huge stick nest in the top of a box-tree. Examination of the nest revealed two young birds just hatched, and the remains of a rabbit and a lizard. In this part of the Mallee may be found many varieties of lizards, the Sleeping or Rugged Stump-tailed Lizard, *Trachysurus rugosus*, the Bearded Dragon or Jew Lizard, *Amphibolurus barbatus*, and the common Dragon, *A. muricatus*, being the most common. That peculiar creature, Burton's Slow-worm, *Lialis burtonii*, generally called a snake-lizard, owing to its

being a legless species, which is quite harmless, and to the uninitiated looks like a snake, is found in this part of the Mallee. It is usually found among the clumps of Porcupine Grass, *Triodia irritans*, or *Spinifex*, as it is sometimes erroneously called. The Sleeping Lizards were noticed eating the flowers of the introduced Cape Weed, *Cryptostemma calendulaceum*, R. Br., perhaps for the sake of the native bees often frequenting them. The lizards are doubtless responsible for the destruction of many young birds, as well as eggs. A Red-capped Robin's nest was found in a tea-tree about 4 feet from the ground, and contained two young birds.

Next day we paid another visit to Wirrengren, and as we drove by a Red Gum disturbed a Boobook Owl, *Ninox boobook*, which flew from the nesting hole of a Galah; this we had examined earlier on the trip, and found to contain two Galah's eggs. Wishing to find out what the owl was doing in the cockatoo's nest, I climbed up, and was surprised to find that the owl had laid two eggs in the nest, and was incubating both its own and the Galah's eggs. It would have been interesting to have watched that nest and noted the final result. Parrots, Pardalotes, and White-faced Honey-eaters were exceedingly numerous in the timber fringing the plain, and many nests were met with, particularly in the dead trees. In a "Lignum" bush, *Muehlenbeckia cunninghami*, a White-faced Honey-eater had built its nest, while not far away two Black-backed Wrens were building in fallen pines. In a tree, some 45 feet from the ground, the huge stick nest of a Wedge-tailed Eagle was seen. I climbed up and found two eggs just on the point of hatching. The nest was 4 feet in diameter, and the pile of sticks fully 5 feet high. We then drove on to the Mt. Jenkins paddock, a delightful natural park—gentle slopes, carpeted with grass and planted by nature with graceful pines, gums, and acacias, as if for the very purpose. An Owlet-Nightjar was flushed from a hollow in a pine where it had been broken off, and on climbing up I found two eggs of the Mallee Parrot and two of the Galah, which, judging by their warmth, the Nightjar had been incubating. This tree is evidently a favourite one with the birds, for Mr. McLennan told us that last season the hollow was tenanted successively by a Pink Cockatoo, a Kestrel, and a Galah, whilst on one of the limbs a White-shouldered Caterpillar-eater had built its nest, and in the sand at its base was the nesting burrow of a Bee-eater, *Merops ornatus*. Close by in the top of a pine tree was the nest of a Brown Hawk, *Hieracidea orientalis*, containing one egg. A Kestrel had started laying in another pine, only 6 feet from the ground. A Rufous Song-Lark, *Cinclorhynchus rufescens*, was seen in this neighbourhood, but it made no sound whatever, and our guide, who had paid special attention

to this species, told us that he had never seen two birds at the same time, or ever heard a note uttered by them. On the road home we noticed a Many-coloured Parrakeet quietly leaving its nest. Inspection showed that its family was just arriving, for the nest contained three young birds covered with white down, as well as four eggs on the point of incubation. Further on we found a parrot's egg on the ground and in good condition. Mr. M'Lennan said that this promiscuous laying of eggs is quite a common occurrence, owing to there not being sufficient hollows for all the birds desiring to occupy them to nest in.

The following afternoon we set out in another direction, and were shown what might be termed a parrot "rookery." Where a swamp had once been, but which was now dry, was a forest of dead gum-trees, each with one or more hollow spouts. These were nearly all occupied by members of the parrot family, the Red-rumped Parrakeet, *Psephotus haematonotus*, and the Mallee Parrakeet, *Barnardius barnardi*, being the most numerous. An Orange-tipped Pardalote, *Pardalotus affinis*, was also noted utilizing a hollow, and they were also found in hollows in the green eucalypts.

Next day (22nd September) we started off on our homeward journey, sad at heart because we were leaving such a splendid ornithological country, in which our studies of the avifauna were but half completed, but at the same time glad at having had the opportunity to add so much so much to our knowledge of some of the species frequenting this favoured district. Being supplied with a good stock-horse, I indulged in a little cattle-droving on the way, and greatly enjoyed galloping through the scrub after the cattle. I was greatly surprised to see the animals feeding on the foliage of the pines as they travelled along the track.

As a parting gift Mr. M'Lennan conducted us to a small patch of Porcupine Grass, which was growing in huge, rotund, pincushion-shaped clumps, to see some emu-wrens which he believed to be new to science. We saw a few of the quaint little birds as they hopped hurriedly from clump to clump seeking hiding places; in these plants they are thoroughly protected by the sharp spines bristling in every direction and forming a rampart against attack. This bird has since been described as new to science, under the name of *Stipiturus mallee*, Campbell (*Emu*, vol. viii., p. 34). As we had a long journey before us we had reluctantly to leave this interesting spot, and after a hearty farewell to our guide "Mallee-Bird," who had made our stay so pleasant and instructive, proceeded on our way to Camba-Canya station, which we reached late in the evening. We spent the night here, and next morning Mr. Poulton drove us to Hopetoun, whence we took train to Melbourne.

I cannot conclude my account of our holiday without referring

to the whole-hearted manner which characterized Mr. Poulton in his efforts to make our trip a success. Although exceptionally busy at the time shearing, and shifting stock on account of the scarcity of water, yet he and his son gave us the services of men, buggy, and horses, and also housed and fed us all the time of our stay. While, not content with supplying our wants during the day, they gave us phonograph concerts in the evening, for Camba-Canya and Pine Plains are connected by private telephone, and, though 30 miles apart, we were able to hear the records quite distinctly.

I am indebted to Mr. St. Eloy D'Alton, of Dimboola, and Dr. Sutton for many items of botanical information, and to Mr. A. H. Kenyon for the loan of lantern slides of the vegetation, &c., of the district.

[The paper was illustrated with a fine series of lantern slides.—*Ed. Vict. Nat.*]

BOOK NOTICE.

THE ANIMALS OF AUSTRALIA: Mammals, Reptiles, and Amphibians. By A. H. S. Lucas, M.A., B.Sc., and W. H. Dudley Le Souëf, C.M.Z.S., M.B.O.U. Melbourne: Whitcombe and Tombs Limited. 327 + xi. pp., with 173 plates and figures. 15s.

This book is designed as a companion volume to "The Animals of New Zealand," by the same publishers, and is written in such a manner as to provide matter of interest for the general reader, as well as information of a more scientific character. Owing to the extent of the subject the birds will be dealt with in a separate volume. The publishers are to be congratulated on having secured such excellent authorities as Messrs. Lucas and Le Souëf as the co-authors of the work. Advantage has been taken of various publications, &c., so as to bring the information up to date, and a fine series of illustrations is included, which will render the identification of species by the non-scientist much easier. The descriptive part of the work is divided into three parts—the Mammals, the Reptiles, and the Amphibia, with the Dipnoi (or Lung Fish), the respective numbers of species being 214, 509, and 62—lizards, numbering 390, being the largest group. Attention is called to the terrible depletion in numbers caused by the hunting of marsupials for their skins, no less than 1,526,000 skins having been sold in the Sydney markets in 1908. Indexes of common names, scientific names, and a systematic table of the orders, families, genera, and species complete a volume which, we trust, will be found of great value as the first attempt to place a portion of our natural history in a systematic manner before the naturalists of the world and the students of our own continent.

ADDITIONS TO THE FISH FAUNA OF VICTORIA.

No. 2.

By J. A. KERSHAW, F.E.S., National Museum.

(Read before the Field Naturalists' Club of Victoria, 13th Sept., 1909.)

LOPHOTES CRISTATUS, Johnson.

In the early part of last month, Mr. W. H. Baldwin, while riding along the shore about 20 miles east of Apollo Bay, noticed what appeared to be a strange fish floundering about in the shallow water. On dismounting, he found it to be a fish about 4 feet long, with an unusually square-shaped head, surmounted by a long, erect spine, and large and slightly prominent eyes, giving to it a rather fierce appearance.

Being afraid to handle it, for fear, as he explained, of being poisoned, he endeavoured to land it by means of a stockwhip he was carrying. Finding the animal altogether too lively, however, he secured a net, by means of which he succeeded in capturing it without serious injury.

The specimen was forwarded to the National Museum, where it arrived in a perfectly fresh and firm condition, although a week had elapsed since its capture.

It proved to be a fine example of a species of the extremely rare Crested Band-fish, *Lophotes*, five species of which have, so far, been described. Of these *L. cepedianus*, Giorna, and *L. siculus*, Swains., are recorded from the Mediterranean; *L. cristatus*, Johnson, from Madeira; *L. capelleri*, Temm. and Schl., from Japan; and *L. fiskei*, Günth., from Cape Colony, South Africa, and New Zealand.

Of the species already described, the specimen here dealt with agrees most closely with *L. cristatus*, Johnson,* and I have little hesitation in referring it to that species.

The body is smooth, elongate, and compressed, with fine reticulated markings along the belly and the anterior portion of the back, its total length, exclusive of the caudal, measuring slightly less than 4 feet 2 inches. Its greatest height is 8 inches, and its thickness $1\frac{1}{2}$ inches. The dorsal line of the body is practically straight for the greater part of its length, sloping away towards the tail. The anterior portion of the ventral edge is slightly curved.

The head is abruptly elevated in a high, fleshy crest, surmounted on the extreme anterior point of which is a long, flexible, flattened spine, 9 inches in length, and furnished with a rather broad fleshy membrane for nearly its whole length, by the lower edge of which it is connected with the dorsal fin.

The dorsal fin is continuous to the tail, its base being sheathed

* Proc. Zool. Soc. Lond., 1863, p. 38.

in a delicate membrane. The longest rays measure 2 inches. The caudal and anal fins are small, the latter situated near the caudal and immediately behind the vent. The pectoral fin is placed low down, close behind the operculum. The extremely small ventral fin is situated slightly below the posterior base of the pectoral, and measures only $\frac{1}{2}$ inch in length. The eye is large, with an oval-shaped pupil, and measures $1\frac{7}{8}$ inches in diameter. The mouth is small, slightly protractile, and is furnished with 3 or 4 rows of small, conical, incurved, sharp-pointed teeth along the front of both jaws. There is a single small, sharp tooth on the vomer and each palatine.

The lateral line is straight, and extends to the caudal; above the hinder edge of the eye it ascends abruptly towards the angle of the crest, which it does not quite reach.

With the exception of one or two rows of rather large, delicate scales along the base of the dorsal, the body is apparently without scales. Three or four small and extremely delicate scales were, however, noticed loosely attached to the lower part of the body, which indicate that the body is possibly scaled in its perfect condition.

When fresh the colour of the upper portion of the body was bright blue, silvery on the lower parts; front of the head darker, with a reddish tinge; opercula and below the eye bright silvery; the lips and extreme anterior edge of the crest slightly tinged with purple; fins bright rosy red; eye silvery.

When first seen the fish was flapping about in 3 feet of water, close in shore, being prevented from reaching deep water by a sand-bar. No doubt its occurrence on our shores was due to recent heavy storms.

According to Mr. Baldwin, the fish, while being secured, ejected a dark, inky fluid from the vent, which discoloured the water all around it.

In 1893, and again in 1896, single examples of a species of *Lophotes* were recorded from New Zealand. These have since been recorded by Hutton,* and later by Waite,† under the name of *Lophotes fiskei*, Günth., a species described by Günther,‡ from Kalk Bay, South Africa.

So far as I can find, this is the first occurrence of this rare genus in Australian waters.

MEMORIAL TO SIR JOSEPH BANKS.—It is proposed to erect in Sydney a statue or some other appropriate memorial to Sir Joseph Banks, who has not inaptly been termed the "father of Australia." That Sir Joseph Banks was most solicitous for the

* Index Fauna Novæ Zeal., 1904, p. 47.

† Records Canterbury Mus., vol. i., No. 1, 1907, p. 33.

‡ Proc. Zool. Soc. Lond., 1890, p. 244.

welfare of the new southern land he did so much to bring before the people of the old country is well known to those who have had the opportunity of perusing some of the literature of the period, but now, through the efforts of Mr. J. H. Maiden, the Government Botanist of New South Wales, we have every detail of Banks's life presented to us in a handsome, well-illustrated volume, published at the moderate price of five shillings, the whole of which amount goes to the memorial fund. Mr. Maiden, with his usual thoroughness, has not only given us Banks's life and work, but, where necessary, has interwoven the names and work of many of his contemporaries and associates—names which every Australian naturalist is more or less familiar with as original collectors or founders of species, genera, &c. The volume is thus a handy compendium of much of the early work done in Australian natural history, and reflects great credit on the author, who has carried out his labour of love so fully, with notes and references, that the future historian of Banks and his times will have little to add. The illustrations, which number over sixty, are in many cases reproductions of historic pictures, &c., and serve to further emphasize every detail of Banks and his connection with Australia. Not the least interesting are the reproductions of Cook's chart of the eastern coast of Australia, with the latest surveys placed alongside, showing how marvellously correct that great navigator was in his delineation of the coast-line, which he was the first to discover. It is to be hoped that the work will have a ready sale, for the purchaser, besides getting full value for his money, will be contributing his mite towards a worthy object. But this need not deter any individual wishing to contribute directly to the fund from forwarding his cheque to Mr. Maiden, who is the hon. secretary to the movement. The New South Wales Government is to be congratulated for its generosity in producing the volume at the public expense, and so enabling the whole of the proceeds to be devoted to the purpose of the memorial.

RECORDS OF THE CANTERBURY MUSEUM.—The second number of this publication is devoted to a record of the scientific results of the New Zealand Government trawling expedition of 1907. Separate reports deal with the Algæ, the Annelida and Sipunculoidea, the Echinoderma, the Mollusca (part 1), and the Pisces (part 1). The latter is by Mr. Edgar R. Waite, F.L.S., Curator of the Museum, who also furnishes an introduction and a series of plates illustrating the method of trawling, &c. The steamer occupied nearly three months in traversing the east coast of New Zealand, and dredging was carried on at 96 different stations. The systematic lists of Algæ, shell-fish, &c., are very complete, and record many new species, several of which are illustrated.

The Victorian Naturalist.

VOL. XXVI.—No. 7. NOVEMBER 4, 1909. No. 311.

FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly of the Club was held at the Royal Society's Hall on Monday evening, 11th October, 1909.

The president, Prof. A. J. Ewart, D.Sc., occupied the chair, and about 90 members and visitors were present.

CORRESPONDENCE.

A letter was read from Mr. H. H. Newton, secretary to the Parliamentary Committee on Daylight Saving, asking for an expression of opinion from the members on the subject. The chairman briefly explained the details of the proposal, and it was resolved, on the motion of Messrs. Barnard and Kearthland, that the Club support the proposal, Prof. Ewart and the hon. secretary being deputed to represent the Club's views before the committee.

VISITOR.

The chairman introduced Mr. A. L. Deane, C.E., an ardent worker in the botany of New South Wales, as a visitor to the meeting. Mr. Deane briefly replied.

REPORTS.

A report of the excursion to Eltham on Saturday, 25th September, was given by the leader, Mr. G. A. Kearthland, who reported a fair attendance of members. The day was not too favourable for birds, owing to a fairly strong wind blowing. The party proceeded towards the river, where, amid the wooded slopes, several interesting birds were noted. Among these may be mentioned the Brown Flycatcher, *Microeca fascians*, the Fuscous Honey-eater, *Ptilotis fusca*, the Fan-tailed Cuckoo, *Cacomantis flabelliformis*, and the Striated and Yellow-rumped Tits, *Acanthiza lineata* and *A. chrysorrhoa*. Many Orioles were heard, but only one pair seen. It was remarked that the locality, once so full of indigenous birds, was becoming more and more the home of such introduced birds as sparrows, starlings, goldfinches, and minahs. The entomologists of the party reported finding several larvæ and chrysalides of the scarce mistletoe blue butterfly, *Orgyris abrota*, Hew. Several members devoted themselves to botany, and were successful in noting many interesting plants, among them the beautiful *Grevillea rosmarinifolia*, which is very abundant in the local cemetery. Here, also, fine specimens of the everlasting *Heli-chrysum lucidum* and of *Daviesia corymbosa* were seen. Towards the river the orchids *Caladenia carnea*, *C. Patersoni*, and *Pterostylis nutans* were obtained. Taken altogether, a very satisfactory outing resulted.

A report of the excursion to Frankston on Saturday, 9th

October, under the leadership of Prof. Ewart, D.Sc., was given by Mr. J. R. Tovey, who reported a good attendance of members. Along the roadside many introduced plants were noted, such as *Bartsia latifolia*, which is usually parasitic on grass-roots; *Sparaxis grandiflora*, and others. Passing over the heath-ground at least 60 species were found in flower, of which *Thelymitra antennifera*, *T. aristata*, *Glossodia major*, and *Diuris pedunculata* were the principal representatives of the orchids. Many white specimens of the beautiful blue squill, *Chamascilla corymbosa* were noted. The white blossoms of *Ricinocarpus pinifolius* and *Leptospermum myrsinoides* were very abundant. Attention was drawn to the floral mechanism of the introduced Cape Weed, *Cryptostemma calendulaceum*, and it was remarked how much this plant had deteriorated in the poor sandy soil till its leaves were barely two inches long, and the inflorescence in some cases possessing only six ray florets.

A report of the junior excursion to Blackrock on Saturday, 2nd October, was furnished by the leader, Mr. E. B. Nicholls, who reported an excellent attendance of some 50 juniors, together with several adult members. The excursion was devoted to ornithology, and many interesting birds were noted. The first nest observed was that of the Yellow Robin, one of the characteristic birds of the belts of tea-tree along the coast. A rare find was a Tawny Frogmouth, which remained on its nest sufficiently long for a photograph to be taken. Several nests of the Mountain Thrush with young birds were seen, the parent bird in each remaining quietly and allowing a good view at close range. In the scrub towards the beach nests of the Brown Tit and Scrub-Wren were found. At the beach several species of sea-birds, such as the Gannet, the Pacific Gull, and the Tippet Grebe, were pointed out, and their peculiarities discussed. Attention was also directed to some of the forms of animal life washed up on the shore, and a passing reference was made to the botanical specimens met with during the afternoon. At the close of the outing the party was entertained at tea at "Woongara," after which an interesting series of bird-skins was shown, and the differences in the species met with during the day pointed out.

On the motion of Mr. Barnard and Dr. Sutton, a vote of thanks was unanimously accorded to Mr. Nicholls for the trouble he had taken to entertain the juniors and make the excursion so instructive.

[Some excellent views showing the proceedings at this excursion appeared in the *Australasian* of Saturday, 9th October.—ED. *Vict. Nat.*]

ELECTION OF MEMBERS.

On a ballot being taken, Mr. Henry Anjou, Neerim-road, Murrumbidgee, Mr. S. Simpson, State school, Glenroy, and Mr.

Ernest F. Thiele, Doncaster, were duly elected as ordinary members; Dr. Wm. H. Semple, Kilmore, as a country member; Mr. L. Martin, Landcox-street, Brighton, as an associate member; and Miss Dorothy Kidgell, 81 Vincent-place, Albert Park, Miss Inez Baglin, Pickett-street, Footscray, Miss Connie Farnbach, Geelong-road, Footscray, Miss Blanche Harris, 11 Napier-street, Footscray, Miss Jean Harris, Droop-street, Footscray, Miss Vera Mitchell, 64 Moreland-street, Footscray, Miss Sylvia Mitchell and Miss Dorothy Mitchell, Hopkins-street, Footscray, Miss Ettie M'Pherson, Droop-street, Footscray, Miss Irene Webb and Miss Joan Webb, Napier-street, Footscray, as junior members.

GENERAL BUSINESS.

Mr. Woolf Marks referred to the excellent display of wild-flowers made for the evening, and asked whether it would be possible to extend the display over the following day, as daylight was more favourable for viewing the flowers than artificial light.

The hon. secretary pointed out that there were several difficulties in the way of carrying out this idea on the present occasion, but thought that, as more interest was being shown in this matter, next year it might be worth while to consider if the exhibition could not be available in daylight. The chairman and Messrs. Coghill and Hardy also referred to the matter.

INTERIM REPORT OF PLANT NAMES SUB-COMMITTEE.

The committee having decided that a report on the work of the Plant Names Sub-committee, appointed to select appropriate common names for the native flowers, would be appropriate on the evening of the wild-flower exhibition, Dr. C. S. Sutton, hon. secretary to the sub-committee, gave an interesting *résumé* of work so far accomplished.

The chairman and Messrs. Hardy, Deane, Hall, and Barnard spoke on different points of the subject, referring to the many difficulties with which the scheme is surrounded.

EXHIBITS.

By Mr. F. G. A. Barnard.—Young Flounders, varying from one to four inches in length, taken from stomach of Flathead caught in Hobson's Bay. Plants of orchid, *Pterostylis nutica* (in bloom), obtained on Melton excursion, October, 1908.

THE TASMANIAN NATURALIST.—The October issue of this journal contains an excellent article, entitled "Guide to the Mollusca of Tasmania, adapted for Young Students," by Mr. W. L. May, which has the additional advantage of being illustrated by drawings of thirty-three species of Tasmanian shells. As the conchology of Victoria and Tasmania is very similar, the article should be useful to beginners here. Copies of the journal can be obtained from the hon. sec. Tasmanian Field Naturalists' Club, Hobart, at a cost of sevenpence (including postage).

EXHIBITION OF WILD FLOWERS.

THE annual exhibition of wild flowers was held in connection with the October meeting of the Club, when a very creditable display was made. Many members had gone to considerable trouble in collecting specimens from country districts adjacent to the metropolis, while friends had sent collections from the more distant parts, such as the Grampians, Wannon, Castlemaine, Mildura, Toora, Mt. Doran (Lal Lal), Wilson's Promontory, &c.

The following were the principal exhibitors, with some of the more notable species shown :—

By Mr. J. W. Audas.—About 35 species from Clayton, including *Epacris obtusifolia*, *Daviesia ulicina*, *Sphaerobolium vimineum*, *Xerotes Thunbergi*, &c.

By Mr. F. G. A. Barnard.—About 20 species from Plenty Ranges, including *Grevillea alpina*, *G. repens* (in bud), *Eriostemon corneifolius*, *Pomaderris elachophylla* (in bud), *Daviesia ulicina* (two varieties), *Baeckea diffusa*, &c.

By Mr. A. G. Campbell.—About 35 species from Pomonal (Grampians), including *Xanthorrhæa australis* (a fine spike), *Eutaxia empetrifolia*, *Brachyloma daphnoides*, *Prostanthera denticulata*, *Thryptomene ciliata*, *Dillwynia hispida*, *Templetonia sulcata*, *Grevillea oleoides*, *G. ilicifolia*, *G. aquifolia*, *Conospermum Mitchelli*, *Styphelia Sonderi*, *S. costata*, *Pultenaea mollis*, *Hibbertia acicularis*.

By Miss Cochrane.—About 20 species from Bendigo and Benalla, including *Swainsona procumbens*, &c.

By Mr. G. Coghill.—About 70 species from Cockatoo and Emerald, including *Banera rubioides*, *Zieria Smithii*, *Pittosporum bicolor*, *Daviesia ulicina*, var. *ruscifolia*, *Pterostylis cucullata*, var. *alpina*, *P. pedunculata*, *Caludenia Menziesii*, &c.

By Mr. J. W. Collings.—About 12 species from Wilson's Promontory.

By Messrs. C. French, jun., and C. Frost.—About 25 species from Dandenong Ranges, including *Pultenaea scabra*, *P. daphnoides*, *Grevillea alpina*, *Pimelea flava*, *Tecoma australis*, *Daviesia ulicina*, var. *ruscifolia*.

By Mr. J. T. Hamilton.—Spike of *Dendrobium speciosum* (cultivated).

By Mr. A. D. Hardy, F.L.S.—About 6 species from Studley Park, Kew, including *Eucalyptus Gunnii*, *Melaleuca ericifolia*, &c.

By Mr. T. S. Hart, M.A.—About 20 species from Mt. Doran Ranges, Lal Lal, including *Chiloglottis Gunnii*, *Claytonia Australasica*, &c.

By Mr. F. Holloway.—About 25 species from Yapeen, near Guildford, including *Grevillea alpina*, *Calochilus Robertsoni*, &c.

By Mr. J. Lindsay.—About 20 species from Wannon, near Hamilton, including *Burchardia umbellata*, *Caladenia Patersoni*, &c.

By Mr. M'Lennan.—About 30 species from Emerald, including *Eriostemon correifolius*, *Spyridium parvifolium*, *Diplarrhena morea*, &c. Also—(1) About 20 species collected by head teacher and pupils of State school, "The Lake," Mildura, including *Cassia eremophila*, *C. australis*, *Loranthus linophyllus* (with flat leaves), *Helipterum moschatum*, *Hakea vittata*, *Acacia Sentis*, &c. (2) About 15 species collected by head teacher and pupils State school, Toora, including *Epacris impressa*, *Tecoma australis*, &c. (3) About 30 species collected by head teacher and pupils State school, May Reef, South Elmore, including *Helipterum pygmaeum*, *Swainsona procumbens*, &c. (4) About 30 species collected by head teacher and pupils State school, Kurting, near Inglewood, including *Calycothrix Sullivani*, *Loudonia Behrii*, *Eriostemon obovalis*, *Baeckea ericæa*, and *Eucalyptus rostrata*, on which almost every flower-bud was galled. (5) About 30 species collected by head teacher and pupils State school, Moyston, near Ararat, including *Thelymitra MacMillani* (rare), *Bauera sessiliflora*, *Dillwynia hispida*, *Pultenaea Benthani*, &c.

By Mr. C. L. Plumridge.—About 25 species from Plenty Ranges, including *Grevillea alpina*, *Goodia lotifolia*, *Eriostemon correifolius*, *Daviesia ulicina*, *Epacris impressa*, *Acacia diffusa*, *Pimelea axiflora*, &c.

By Dr. Sutton.—About 25 species from Evelyn, including *Pultenaea Muelleri*, *P. daphnoides*, &c.

Flowers of the following Victorian plants, grown in the Melbourne Botanic Gardens, were exhibited by Mr. F. Pitcher, on behalf of the Director :—

Acacia salicina, Lindley, var.
Aphanopetalum resinosum, Endl.
Bauera rubioides, Andrews
 „ „ var. *alba*
Calycothrix tetragona, Labill.
 „ *Sullivani*, F. v. M.
Clematis aristata, B. Br., var. *Dennise*
Commersonia Fraseri, J. Gay
Dillwynia cinerascens, R. Br.
Epacris longiflora, Cavan.
Eriostemon myoporoides, De C.
Eucalyptus sideroxylon, A. Cunn.,
 var. *rosea*
Eutaxia empetrifolia, Schlech.
Goodia lotifolia, Salisb.
Grevillea aquifolium, Lindley
 „ *lavandulacea*, Schlech.
 „ *Miqueliana*, F. v. M.

Grevillea oleoides, F. v. M.
Hardenbergia monophylla, Benth.
Kennedyia rubicunda, Vent.
Lasiopetalum dasyphyllum, Sieber
Micranthemum hexandrum, Hook. f.
Myoporum viscosum, R. Br.
Olearia myrsinoides, F. v. M.
 „ *stellulata*, Labill.
Pittosporum phylliræoides, De Cand.
Prostanthera rotundifolia, R. Br.
Pultenaea Muelleri, Benth.
 „ *villosa*, Willd.
Stypandra glauca, R. Br.
Tecoma australis, R. Br.
Veronica perfoliata, R. Br.
Westringia glabra, R. Br.
 „ *rosmariniformis*, Smith
Zieria Smithii, Andrews

WATTLE-TIME, OR "YELLOW-HAIRED SEPTEMBER."

By A. J. CAMPBELL, Col. Mem. B.O.U.

(Read before the Field Naturalists' Club of Victoria, 13th Sept., 1909.)

WITH the opening of September another Australian spring may be said to dawn, a time when the whole land is abloom with wattles, or, more correctly, acacias, in their many exquisite shades of yellow, and perfuming the air with their delightful incense. Were it possible to ascend above our city to an altitude where we could obtain a bird's-eye view of the whole State, and with an eagle's vision scan the land from end to end, or from the Murray to the sea, we would see the sinuous courses of our rivers more or less traced in yellow by the golden tops of regiments of water-side acacias—the familiar Silver Wattle, *Acacia dealbata*.

But wattles are not confined to the streams alone—the mountains have their own varieties, and wear their cloths of gold; even the Mallee, so often regarded as a wilderness, is illuminated with some of the choicest kinds, dressed in suits of lemon-yellow.

In all this wealth of aurelian beauty where to begin to individualize the species perplexes one. Since Australia possesses something like 400 species, out of a world total of about 500, surely it may justly be regarded as our national flower, and should be worshipped accordingly.

To-night we are not concerned with the commercial value of our wattles—for this aspect of the subject is to be by no means despised. Many of the species produce bark valuable for the large quantities of tannic acid it possesses; then the timber of more than one species is a valuable asset, and eagerly sought by the cabinetmaker, wood-turner, &c. But let us briefly consider them from an æsthetic point of view. Witness their shapely forms, the perfect beauty of their soft, fluffy, masses of golden balls, or the goodly fragrance of their blossoms!

A few words about their life-history may not be amiss. The germination of a wattle seed is truly a revelation of nature's secret ways. It is born in a small pea-like pod, contracted slightly between each seed, and is cast upon the world when its cradle opens with the warmth of the summer sun. For the battle of life it is better equipped than many other seeds, being encased in a tough ebonite-like integument or skin, which shelters well the delicate embryo within. So strong, and under ordinary circumstances almost indestructible, is this protective casing that the seed may lie for years unhurt, and yet germinate when suitable conditions arrive. It is on record that wattle seeds have germinated after remaining dormant in the ground for thirty-seven years. At Armadale wattle seeds, perfectly sound, have been

picked up after having lain in a paddock for at least twenty years. Wattle seeds, when shed, may travel great distances, sliding over the ground on their hard, polished coatings, or they may float on the surface of a stream, for they are, unlike most seeds, lighter than their own bulk of water. At length having found a haven of rest, the rains of winter may slowly coax the tough covering to expand until it fractures, and thus sets free the hidden life within.

Perhaps the most remarkable character of wattle seed is that roasting by fire will not destroy it. This fierce ordeal only sooner sets free the embryo within; thus it is a well-known fact that when a bush-fire has swept through the forest, young wattles spring up as if by magic, and will often be thickest where the fire was fiercest, such as around the sites of logs or masses of brushwood, thus apparently proving that the violence of the flames is more effectual in cracking the tough integument than the persuasiveness of continued moisture. Hence, profiting by the methods of Nature, man, when he wants to ensure the early germination of wattle seed, roasts it in a pan over the fire or scalds it in boiling water. By either method the outer skin is fractured, and the seed when planted readily puts forth its green and tender shoot in less than three weeks' time.

Let us now briefly glance at some of the more notable forms among our yellow-haired friends. One of the best known, and perhaps the most conspicuous about Melbourne and suburbs after the winter solstice, is *Acacia Baileyana*, or the Cootamundra Wattle, which, taking kindly to cultivation, has been introduced from New South Wales, and is usually seen in full bloom during July. Its small, mimosa-like, glaucous or bluish-grey foliage, and its branchlets bearing abundant crops of tiny balls of rich lemon-chrome, must be familiar to all. Though its original habitat is a very restricted area in the mother State, it has been introduced into nearly every public park and garden throughout the Commonwealth. Its discovery was due to that veteran botanist, Mr. F. M. Bailey, the then Government Botanist of Queensland, who, when on one of his exploring excursions in the neighbouring State, espied its graceful form, and, promptly forwarding specimens to the *doyen* of Australian botanists, the late Baron von Mueller, was rewarded by having the species called after him, hence in *Acacia Baileyana* we have recorded for all time the name of one who has done valuable work among the plants of the youngest of the Australian States.

When the blossoms of *Acacia Baileyana* begin to wane the Silver Wattles of south-eastern Australia and Tasmanian are just bursting into bloom, and by the end of August the majority are in their prime and waiting to welcome "Yellow-haired September." The Silver Wattle, *Acacia dealbata*, was the species

referred to in an early paragraph as lining our rivers with borders of gold. Though called "silver," from the silvery appearance of its feathery foliage, "water-side" would be both a poetic and a more accurate popular name, for they flourish chiefly along our streams or on the alluvial flats close by. For a typical scene of Silver Wattles one need not go further than our home river, the ever-flowing Yarra, where, say between Heidelberg and Eltham or Warrandyte, in bend succeeding bend may be seen the yellow-laden trees like curtains screening the stream, some of the flowering tassels kissing the water on one side, while others, bending over beds of pennyroyal and maiden-hair fern, sweep the river's bank. Climb some adjacent hill or other coign of vantage and gaze upon a huge letter S, which the river, lined with yellow, has carved in the green landscape—such a scene may be witnessed from the heights above Yarra Glen, and in a wattle season *par excellence*, as that of 1907, is worth travelling miles to see. In other seasons the best of the flowering trees may be at intervals more or less wide, or their beauty may be torn and shattered by the winter's storms and floods.

We might be tempted to satiate our dreamy senses amid the scenes of Silver Wattles were not other wattles to be seen afield—to wit, the splendid Green Wattle, *Acacia normalis*, which flowers concurrently with its silver relation, to which it is closely allied. This species flourishes on land away from water; its feathery foliage is art-green instead of silvery, and in season is flowerful from the lowest branchlets that sweep the grass to the topmost stem, a veritable glory of the bush, a pillar of perfume, under whose shadow one might sit in an ecstasy of delight. The Green Wattle abounds in the sandstone region around Sydney, and brought to our own State does equally well on the sandstone ridges of the Grampians.

September sees the Golden Wattle, *Acacia pycnantha*, with its stiff, eucalypt-like leaves—more properly phyllodes, quite different to the bipinnate or feathery leaves of the previously mentioned kinds—in full flower, each tree ablaze with bunches of furry balls, each often the size of an ordinary marble, of the most voluptuous shade of rich citron-yellow. It is a hardy species, and thrives on auriferous country inland, on the rich chocolate soils of some of our mountain ranges, or on the poorer coastal soils of New South Wales, South Australia, and Victoria. Speaking of auriferous country, one wonders if the early squatters ever thought that these glorious Golden Wattles were tokens of the precious stores of gold below. Think of the rich yields of Ballarat, Bendigo, Beaufort, and other places where this wattle flourishes. But why call it "golden," when so many other kinds are golden also when in bloom? To this question there seems no reply. Perchance it may be only a happy vernacular for a wattle that

happens to flourish on the surface of gold-bearing country. If you want to see Golden Wattles in their prime, visit the You Yangs some balmy spring day in September, climb up one of the granite piles among shapely She-oaks and stunted Blue Gums, past bushes entwined with clematis crowded with cream-coloured star-like flowers, with here and there a purple sarsaparilla, *Kennedyia monophylla*, trailing on the rocks, to the summit, and see below a landscape indescribable for beauty on account of its billows of yellow bloom set in a sea of green foliage resulting from the wealth of Golden Wattles growing in the adjacent forest reserve.

My earliest recollections, as a child, of Golden Wattle are of the nodding yellow plumes, which seemed to beckon me, borne by slender saplings that grew in the dear old box forest at the foot of Mt. Cotterell, not far from the present Rockbank railway station. No part of the country within the same distance of Melbourne has changed so little since that day as the Pinkerton Forest, as it is locally called. Eight-and-forty years have passed since I saw the last grave closed in that sacred, secluded spot, "the Forest of the Five Graves," where loving hands have since planted a group of wattles, which at this moment are beautiful by reason of their blossomy balls of yellow.

A great and grand tree which towers proudly erect beside other tall timber in the mountain gullies of Gippsland and Tasmania is the Blackwood Wattle, *Acacia melanoxylon*. From Blackwood boards beautiful furniture is made, while the so-called "fiddle-back" (really a twist in the nature of the tree caused by stress or storm), when subjected to the polisher's skill, is among the handsomest of cabinet woods. The blossoms of the Blackwood are neither so conspicuous in colour nor in character as those of many other wattles, being somewhat small, of a pale lemon or yellowish-white colour, but their aroma pleasantly perfumes the forest when the frankincense of the sassafras is done. For photographic effect one must choose saplings, when flowers and foliage, infant-like, are fair and plump. In the year 1898 there was a fine display of young Blackwoods in bloom at the upper end of the Werribee Gorge, where the whole river bend was full of trees apparently more crowded with blooms than leaves. Such a sight is rare to behold.

In the tea-tree groves by the sea-shore, in sunny glade and in shadowy scrub alike, the Coastal Wattle, *Acacia longifolia*, runs riot in bushes sometimes erect, but as often spreading over the sandy soil, and aflame with lengthened spur-like, rich lemon-yellow flowers, and in such abundance that every little sandy hollow near seems to hold the strongly diffused perfume. This species may be said to most enthusiastically celebrate "Yellow-haired September." The finest brakes of this sea-side wattle,

forming quite coppices in their way, are to be found along the coast of south-eastern South Australia.

Those who have not the opportunities to travel far afield to witness the more familiar wattles which I have mentioned in their natural surroundings will experience a delightful treat in visiting the Melbourne Botanic Gardens, where a score or more kinds may be seen in full flower during the season, some of the more striking species being the Crescent-leaved Wattle, *Acacia lunata*; the Alpine Wattle, *A. pravissima*; the Myrtle-leaved, *A. myrtifolia*; the Knife-leaved, *A. cultriformis*; and the showy, *A. spectabilis*, &c., in various captivating shades of yellow.

At the vernal equinox the attendant wild gales are often the bearers of wattle perfume, gathered from field and forest, while pollen dust absorbed by the passing breeze has later on been precipitated by the welcome rain, leaving a golden sediment on our city roads or streets. Gales of wind and wet usually dishevel and despoil the fair locks of "Yellow-haired September," but with the advance of bright October other wattles step in to continue the colour scheme.

In the east there is the Scrub Wattle, *Acacia leprosa*, a bush of pendulous habit which illuminates the forested hills with its bunches of bloom of bright lemon-chrome, and mingled with the soft perfume is the aromatic aroma of its foliage. Away in the west, near Cape Leeuwin, the beautiful-leaved gum forests and giant Karri Karri tracts are bathed in yellow splendour by reason of two striking species of wattles, which, blooming unheeded in the woody wilderness, are known only by the stern botanical names of *Acacia divergens* and *A. pulchella*, but having seen these in their natural setting their modest beauty will ever remain in the memory.

While in the great western land, let us pause to admire another and larger species, the Western, or, as sometimes called, the Weeping Wattle, *Acacia saligna*, on account of its drooping branches, which skirt-like cling about its figure. It is a most ornamental tree, which is attested by the fact that it has been introduced and freely cultivated in the public gardens of the eastern States. During October every branchlet bears burdens of fluffy balls, deep chrome yellow in colour. Their perfume, however, is somewhat overpowering if taken into a room, and for that reason they are better left upon the trees, where, as in other kinds, their matchless beauty is better seen in contrast with the natural greenery of the leaves. Had the poet Burns dwelt in this southern land of ours, instead of the familiar couplet he would probably have written—

"For pleasures are like *wattles* spread,
You seize the flower, its bloom is shed."

Another October-flowering species cannot be passed over—the Prickly Wattle, or Kangaroo Thorn, *Acacia armata*, well known as a hedge plant around the metropolis and elsewhere, and appearing so gay when decked with its bright yellow balls, each on a conspicuous stalk, and protected from the vandal by sharp needle-like spines—hence the botanical name. A good specimen of this acacia when in bloom is not to be despised as a flowering shrub. It is perhaps the oldest known of Australian acacias, and was recorded by the early explorers of the Port Jackson district. At the You Yangs there are natural lanes of this wattle, where the rabbits play and the foxes prowl. It grows to perfection on Kangaroo Island, off South Australia, in the hollows of the limestone hills of that most picturesque place. In it numerous birds, such as Warblers, Honey-eaters, and Tits, find secure retreats, and love to build their nests. Indeed, even human beings might be tempted to camp under the snug and inviting flowering bushes if it were not for the fear of settling upon serious trouble—detached thorns, unseen and scattered in the grass.

In wattle time, the more daylight the more delight. Let us hasten on to November, when the Black Wattles, *Acacia decurrens* and *A. mollissima* spread their perfume afar over the land. The Black Wattle is a tree highly prized in commerce, for as a tanning material its bark possesses the highest percentage of tannic acid. It enjoys a goodly range, from Queensland to South Australia, including Tasmania.

Some sound authorities maintain that the Silver, the Green, and the Black Wattles are merely geographical varieties of the same species. That may be so, but the field observer seeks a reason why the Silver and the Green have rich yellow flowers and bloom in early spring, while the Black (a name suggested by its dark-coloured bark and foliage) waits till the summer to put forth its floral splendour of pale yellow. Can the same species have two seasons and two colours? Again, where does the geographic distinction come in if the respective trees grow in the same locality? True, one is at the water-side, the other on the hill. Exchange their environments and they perish, or at least they do not thrive.

Black Wattle is found in every bit of bush; in fact, if you cut down the standing forest and send a fire through it, wattles spring up thickly, seemingly where they never existed before, for the reason already mentioned when speaking of the germination of the seed. Nowhere are finer trees for blossom to be seen than in that favoured locality, the You Yangs. About the beginning of November the hills and hollows are fairly flushed with its pale or Naples yellow blossom. Mount some massive granite tor and take in the scene. You appear to be encircled with Black

Wattle heads mottled with flowering patches, not so thickly or so rich in colour as the blooms of the Silver and Green Wattles, nevertheless very æsthetic in tone. In shape Black Wattles are rotund; others with unrestricted freedom recline among the lichen-covered rocks, the whole place being redolent with strong wattle perfume, which is agreeably modified by an admixture of the fragrance given off by the Snowy Mint-bush, *Prostanthera nivea*, and other sweet-scented shrubs around.

Cross over to Tasmania and see the wattles along the banks of the Tamar, where they may be seen competing in colour with the flowering Peppermint Gums. In November and December the pretty red-tiled villas of Trevallyn are embowered in wattles, full of bloom, giving forth their delightful fragrance.

Black Wattles are felled not only for their bark for tanners' use, but for their wood, which is highly prized for use in the bakers' ovens. Away in Western Victoria is a range of mountains with serrated and curiously tilted peaks—the Grampians, the “Sierra Nevadas” of Victoria—whose well-watered slopes, once the home of countless wattles, have been cleared, and are now occupied by fruitful fields of apples.

We have now reached midsummer, when the Silver Wattles of “Yellow-haired September” appear in seed, their suspended pods hanging in nut-brown clusters or purple patches; myriads of the tiny jet-black seeds are already shed, some carried afar by birds, thousands of the exploded pods have fallen and float like fairy canoes upon the shrunken pools, too low for stream or current to bear them off. But other wattles are still in flower, though in lighter shades of splendour, for, according to the species, the flowers range from almost white to deepest chrome, and it may be accepted as a general rule that those which flower in winter and spring possess the rich yellow shades, while those which bloom in the summer and autumn wear the paler tints.

Another fine wattle which has been introduced into Victoria from New South Wales, where it is fairly common, and like many other wattles rejoices in several popular names, such as Wellington, Cedar, Hickory, &c., is the New Year Wattle, *Acacia elata*. Its foliage is like that of the well-known introduced Pepper-tree, *Schinus molle*, and it is the first wattle to flower at or after the New Year, hence the choice of an appropriate vernacular would seem to rest between the names “Pepper-tree Wattle” or “New Year Wattle”—which? It is certainly not a “Cedar” or a “Hickory,” or even a “Wellingtonia.” Its botanical title, *elata*, is euphonious and easily remembered. It is an exceedingly ornamental tree, and fine specimens may be seen in many private gardens in the different suburbs and in the Botanic Gardens. An especially fine pair guards the lodge opposite

Millswyn-street, South Yarra. The city fathers of Prahran have permitted by way of experiment the planting of a street with this wattle, and should they succeed the next generation of citizens may be able to stroll under "Elata" groves instead of "Elm" and other groves as at present. Think of the splendour and delightfulness of these "Elata" groves in a hot January, when the umbrageous trees shade our streets and the delicate perfume from the top crested with large pale yellow flowers is wafted through open doors and windows and permeates our dwellings.

When the burning beams of a summer sun are drying up the land during "fiery February," when many trees and shrubs languish in the heat and fallen leaves crumple and crackle under foot, another wattle, the proper Lightwood Wattle, *Acacia implexa*, is gay, if not gorgeous, with its shining foliage intermixed with yellowish-white furry balls. The leaves are crescent or sickle-shaped in form, and the tree is sometimes mistaken for the Blackwood, which, however, grows in generous soil, alluvial tracts, while the Lightwoods love the hills and such like localities as the rocky battlements of the famous Werribee Gorge, where their rotund forms may be seen, supported by rough-barked, twisted stems, standing firmly with rock-encrusted roots.

The Willow Wattle of Riverina, *Acacia salicina*, also sometimes flowers during "fiery February," when the drought-stricken earth seems to have put off all its beauty. At such a time the River Murray, great in winter, is below summer level, and well-nigh stationary, with shoaling sands and submerged snags, the latter as seen through the transparent water bearded with green filamentous algæ; yet not far distant may be seen splendid specimens of the Willow Wattle, shapely in form, gracefully draped with pendulous branches of fine-leaved foliage, each branchlet as it droops being dotted with greenish-white flowers, which emit a somewhat pungent perfume—a strong tree with a strong scent. When the seeds are fully ripe the long containing pods, half open, expose unusually large black seeds, each surrounded by a bright vermilion rim—fit embryos of one of the largest of our wattle trees.

Many wattles bloom in March, and to match the month, so far as initials go, we have one known as the Maiden Wattle, *Acacia Maideni*, named by the late Baron von Mueller after Mr. J. H. Maiden, F.L.S., Director of the Sydney Botanic Gardens, and an ardent lover of wattles. The Maiden Wattle belongs to the Blackwood and Lightwood series, but with lengthened flowers instead of globular. It is a native of New South Wales, and has been introduced to Victoria, where it does well. It may be seen in the Melbourne Botanic Gardens, and at Armadale last season

one was to be seen flowering in the garden of Mr. C. Catani, our esteemed Engineer of Roads and Bridges, also a true wattle "apostle."

Several autumnal-flowering wattles make April gay. In the Grampians, for instance, you will find a variety in whipstick form—in fact, it might be conveniently called the "Whipstick" Wattle—bearing lengthened leaves, and topped with tufts of delicate yellow, diffusing the most delicate of perfumes. By creeks and gullies the trees grow more bushy and branchy, and are almost the only native flowers seen until the heath-like *Epacris*, in big bells, white, pink, or salmon to deepest crimson, commences to tint the scrub.

In the sandy tracks of eastern Gippsland and the coastal region of New South Wales grows a wattle of somewhat straggling habit, yet with true mimosa-like foliage, rich art-green in colour. This is *Acacia discolor*. It has been called the Sunshine Wattle, but why call it "Sunshine" when, as Mr. Maiden says ("Wattles and Wattle-barks," p. 56), all wattle flowers are "emblems of sunshine." The Sunshine Wattle when in flower is adorned all over with bracts, each bearing a dozen or more lemon-yellow balls, but in this case the perfume is not at all pleasing.

In having thus enumerated a few of our favourite wattles in illustrating my theme of "Yellow-haired September," it will be noticed I have also run the seasons round, and so incidentally constructed a "Floral (Wattle) Calendar," but at the same time it must not be inferred that the wattles mentioned do not bloom in other months than those stated, for situation has much to do with early or late blooming of many of the species.

As I commenced in July with the graceful *Acacia Baileyana* let me conclude with the Sweet-scented Wattle, *Acacia suaveolens*, which is perhaps at its best in June. True to its specific name, its light-coloured tufty flowers are indeed sweet-scented, and on the heath-covered tracts along the eastern shores of Port Phillip Bay this wattle finds a congenial home, sometimes springing in patches of stiff-leaved single stems knee high, at other times appearing as a solitary bush several feet in height.

Time, and perhaps your patience, forbid to tell to-night of the Gum-topped Wattle, *Acacia penninervis*, of Gippsland, found as near Melbourne as the Blacks' Spur, at Healesville, and in the ranges of the far Upper Yarra; of the Myall and the Mulga of the vast interior of the continent; of the Brigalow, *Acacia harpophylla*, of Queensland; of the Jam-wood of Western Australia, *Acacia acuminata*, so called because its scented wood is so suggestive of the flavour of raspberry jam; or of that curious species, *Acacia farnesiana*, from Northern Australia, known as the Sponge-tree, which puts forth its globular flowers of old gold amid a development of small, rich green crinkled or sponge-like

foliage. Therefore please let it suffice just to have mentioned these in concluding my sketch of "Yellow-haired September," so named by our Australian poet, Kendall.

[The paper was illustrated by a series of lantern slides of the various species mentioned.—ED. *Vict. Nat.*]

RE *AMYTIS VARIA*, CARTER.

To the Editor of the *Victorian Naturalist*.

SIR,—Referring to the bird which I described provisionally as a new species—viz., *Amytis varia* (see *Vict. Nat.*, vol. xxv., pp. 75 and 86)—the skins that I obtained are regarded by ornithological experts as being *Amytis macrura*, although no skins of this species were in the collections of either Sydney, Melbourne, or the South Kensington Museums, and I was unable to make a comparison with the type skins, which are in Paris. Gould gives the total length measurement of *A. macrura* as five and a half inches, but this is apparently an error, and as his "Handbook" was the only work I had giving measurements of this species, I formed the opinion that the birds obtained by me were new to science.—Yours, &c.,

TOM CARTER

(Of Broome Hill, Western Australia).

Masham, Yorkshire, 16th August, 1909.

BIRD DAY.—The first Bird Day instituted by the Education Department for the benefit of the scholars attending the State schools of Victoria was celebrated on Friday, 29th October. A special programme of lessons, dealing with various aspects of bird life and laying particular stress on their protection and preservation, was carried out. In the smaller schools, where possible, excursions were made to localities frequented by birds, and lessons given in the field. In the metropolis, as this was impossible, the services of a number of natural history enthusiasts were secured, and practical demonstrations on the value of birds were given by members of the Field Naturalists' Club, the Ornithologists' Union, and the Bird Observers' Club, to the senior classes of the suburban schools. On the whole, the movement was a success, and it is hoped will lead to more interest in our feathered friends, without whose aid human life would almost become impossible. Advantage was taken of the day to inaugurate the Gould League of Bird-Lovers, and some 50,000 children handed in their names as willing to observe its precepts. We trust this movement will, as the years roll by, greatly lessen the destructive pot-hunting which takes place on every holiday.

OTHER SOCIETIES.—The Australasian Ornithologists' Union has had, during the month, a very enjoyable "camp-out" in the Port Lincoln district, South Australia, particulars of which will appear in an early *Emu*. The Microscopical Society of Victoria, to mark the opening of its second year, held a *conversazione* and exhibition of objects in the upper hall of the Athenæum on Tuesday, 26th October, which was well attended.

FLOWERS IN GLASS.—In the *Selborne Magazine* for September, 1909, Mary W. Porter gives an account of the making of the "Ware Collection" of glass flowers in Harvard University. These flowers are the result of years of patience and practice by Leopold and Rudolph Blascka, two Bohemian glass workers, who have made a specialty of natural history objects for many years. The article reads almost like a fairy tale, as the following quotation will show:—"The glass flowers are in sprays and clusters precisely as one sees them in nature, and indeed the living flowers seem to lie before one, so delicate and accurate is the workmanship displayed in them." "The importance of the collection from an artistic or botanical point of view cannot be overestimated. With regard to its botanical accuracy, William Deane, the botanist, says that it is positively startling. He examined sixteen species by careful comparison, besides making a more general observation of a large number. Take, for instance, *Aralia spinosa*, L.: the building up of the complex inflorescence, with its multitudinous minute flowers, is almost beyond belief. In this cluster, with its flowers so small that their structure can be seen only with a lens, while many of its buds, blossoms, and developing fruit are so minute as to be indistinguishable to the naked eye, I counted of buds, blossoms, and developing fruit, from 2,500 to 3,000. And yet every flower has its five petals and five alternating stamens with long filaments. I sought to find on the under part of the cluster some flowers perhaps less carefully done, as being practically out of sight, but they were all equal in their perfection, the immense compound leaf shown, the spines scattered irregularly along the stalk and midribs. Were every specimen in the collection to be inverted the same accurate work would be seen. Every plant tells the same story of nature closely followed out, and I am glad to bear my testimony to the almost magical work of Leopold and Rudolph Blascka." At the present time 687 species of flowering plants are represented, belonging to 520 genera and 147 natural orders; the morphology (cross sections and other magnified details) is exhibited by more than 2,500 details. All are true to colour, and Harvard University is to be congratulated on being made the recipient of such a marvellous collection, which, it is hoped, will be completed in two years' time.

The Victorian Naturalist.

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FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly of the Club was held at the Royal Society's Hall on Monday evening, 8th November, 1909.

The president, Prof. A. J. Ewart, D.Sc., occupied the chair, and about 60 members and visitors were present.

CORRESPONDENCE.

A letter was read from Mr. H. J. Oke, Agricultural High School, Wangaratta, inviting members of the Club to join the District Teachers' Association visit to Buffalo Gorge, on Friday and Saturday, 19th and 20th November, 1909.

REPORTS.

The chairman reported having, along with the hon. secretary, attended the Parliamentary Committee on Daylight Saving and given evidence in favour of the proposal.

A report of the excursion to Bayswater on Saturday, 10th October, was forwarded by the leader, Mr. C. French jun., who reported an interesting outing. Fourteen species of orchids were noted, among them being *Caladenia Cairnsiana*, *C. suaveolens*, *Calochilus Robertsoni*, and *Thelymitra aristata*, of which fine specimens were collected. A large number of fine specimens of the curious lycopod, *Phylloglossum Drummondii* were secured for the National Herbarium. Insects as a rule were scarce.

A report of the motor-boat excursion on the Yarra, at Studley Park, on Saturday, 17th October, was given by the leader, Mr. A. D. Hardy, F.L.S., who reported a very enjoyable outing. The scenery along the river had been greatly admired by those who had seen it for the first time. A landing had been effected in the Asylum reserve at Kew, where a little botanizing was done, and he thought the experiment was worth repeating another season.

A report of the excursion to Graham Falls, Belgrave, on Cup Day, Tuesday, 2nd November, was given by the leader, Mr. F. Pitcher, who reported a good attendance of members. Favoured by a splendid day, an enjoyable outing had resulted. A fine variety of fern-gully vegetation had been met with, and specimens obtained of a variety of tea-tree, which had not yet been determined. The entomologists of the party had also done fairly well, while from a scenic point of view the locality was well worth visiting.

A report of the junior excursion to Hampton on Saturday, 6th November, was given by the leader, Mr. C. J. Gabriel, who reported a good attendance of junior members. The afternoon

was devoted to marine mollusca, of which about fifty species were noted. Many interesting forms were taken alive, including *Philine angasi*, Crosse.

The hon. librarian acknowledged the receipt of the following donations to the library :—" Expedition to Islands of Bass Strait by the Australasian Ornithologists' Union, 1908," album of photographs and map, from Mr. A. H. E. Mattingley, C.M.Z.S.; " Descriptive Guide to the Melbourne Botanic Gardens," by W. R. Guilfoyle, F.L.S., Director, from the author; " Victorian Hill and Dale," by T. S. Hall, M.A., D.Sc. (purchased); " Animals of Australia," by A. H. S. Lucas, M.A., B.Sc., and W. H. Dudley Le Souëf (purchased); " Confessions of a Beachcomber," by E. J. Banfield (purchased); *The Microscope*, Nos. 11 and 12, from Watson and Sons; *The Geelong Naturalist*, second series, vol. iv., No. 1 (August, 1909), from the Geelong Naturalists' Club; " Report of Trustees of Public Library, Museum, and National Gallery of Victoria," for 1908, from the trustees; " Memoirs of the Geological Survey of Victoria," Nos. 7 and 8, from the Department of Mines, Melbourne; *Journal of Department of Agriculture*, Victoria, August and September, 1909, from the department; *The Australian Naturalist*, vol. 1, part 15 (July, 1909), from the New South Wales Naturalist Club; " Proceedings Linnean Society of New South Wales," vol. xxxiv., part 1, from the society; " Records of Australian Museum, Sydney," vol. xii., part 4, from the trustees; *Agricultural Gazette of New South Wales*, August and September, 1909, from the Department of Agriculture, Sydney; Report of Public Library, Museum, and Art Gallery of South Australia, for 1908, from the trustees; *The Queensland Naturalist*, vol. i., No. 3 (September, 1909), from the Queensland Naturalists' Club.

ELECTION OF MEMBER.

On a ballot being taken, Mr. Alex. D. Selby, National Park, *viâ* Yanakie, was duly elected an associate member.

PAPERS READ.

1. By Messrs. G. A. Waterhouse, B. Sc., F.E.S., and G. Lyell, F.E.S., entitled " New and Rare Butterflies of the Genus *Miletus*."

The authors remarked that in the *Lycænid* genus *Miletus* are now placed some of the butterflies formerly included in the genus *Hypochrysops*. They gave a full description of *Miletus apollo*, formerly known only from a single damaged male specimen in the Queensland Museum, from specimens obtained at Cape York, North Queensland; *Miletus panætha*, a new species, of which both sexes were taken at Cape York by Mr. H. Elgner; *Miletus elgueri*, a new species from Prince of Wales Island, Torres Strait, also captured by Mr. Elgner; and *Miletus*

erythrina, a new species taken at Port Darwin by Mr. F. P. Dodd.

2. By Mr. J. A. Kershaw, F.E.S., entitled, "Notes on the Hairy-nosed Wombat, *Phascalomys latifrons*, Owen."

The author stated that he had recently seen some skins of this animal in the National Museum, marked "Deniliquin, N.S.W.", and as the animal was usually regarded as being confined to South Australia, he was led to try and trace their origin. Though some twenty years had elapsed, he had been fortunate in getting into communication with the donor of the specimens, who assured him that the record was correct, and, though probably now extinct in the locality, the range of this species must be extended to include south-western New South Wales.

3. By Messrs. J. H. Gatliff and C. J. Gabriel, entitled "First Record of the Animal of *Voluta mamilla*, Gray, with Remarks thereon."

The authors stated that though this shell had long been known, and is one of the largest of our Victorian Volutes, measuring some seven inches in length, it had not been found alive until taken recently off Gabo Island by the Commonwealth trawler *Endeavour*, while searching for new fishing grounds off the south-east coast. Photographs of the animal were exhibited, and the singular fact was stated that the radula was no larger than that of an ordinary limpet.

4. By Dr. T. S. Hall, M.A., entitled "Ungarnered Grain."

The author pointed out many directions in which members of the Club could be of use in clearing up difficulties, and in adding to our knowledge of the workings of Nature, and urged all who had the opportunities to seize them, and record their observations on certain groups which were fast passing away from our midst, owing to the clearing of forests, draining of swamps, &c.

The paper gave rise to considerable discussion on several of the points raised.

Mr. J. Booth thought that much might be done by members working together in small groups.

Mr. O. A. Sayce said that, to encourage workers, it was necessary that those having special knowledge of a subject should be able and willing to impart the necessary stimulus, and mentioned how he had been encouraged when studying the fresh-water crustacea by authorities in other lands.

Mr. F. Wisewould endorsed the author's remarks, and urged immediate attention to several groups, which, owing to the spread of settlement, were likely to be very difficult of study before many years passed.

Mr. F. G. A. Barnard thought the main difficulty in the way of study in this part of the world was the absence of an educated leisured class. All our workers were engaged in the struggle for

their daily bread, and could spare only odd moments for the minor details of natural history.

The chairman thanked the author for pointing out so concisely the various directions in which openings existed for useful work, and, with regard to botanical lines of study, said that recording the various methods of pollination of Australian flowers, photographing plant associations, or drawing our native flowers, were some of the ways by which those who had the opportunity could greatly add to our botanical knowledge.

EXHIBITS.

By Mr. F. G. A. Barnard.—Pot-grown specimen of Native Beech, *Fagus Cunninghami*, Hook.

By Messrs. J. H. Gatliff and C. J. Gabriel.—Shell of *Voluta mamilla*, Gray, and radula of same, in illustration of paper; also shells of *Voluta magnifica*, Chemnitz; *V. fusiformis*, Swainson; *Melo indicus*, Gmel.; *Cymba proboscidalis*, Lam.; and *C. olla*, L., for comparison.

By Mr. J. A. Kershaw, F.E.S.—Skins of Hairy-nosed Wombat, *Phascodomys latifrons*, Owen, and of Common Wombat, *P. mitchelli*, Owen, in illustration of paper.

By Mr. A. H. E. Mattingley, C.M.Z.S.—A live Worm-Snake, *Typhlops*, sp., from Eyre's Peninsula, S.A.

By Mr. E. F. Thiele.—Nest and eggs of Red-wattle Bird, *Acanthochara carunculata*, from Doncaster.

By Mr. F. Wisewould.—Large mud cast from entrance to chamber of land-crab, *Engæus*, sp., from Pakenham.

After the usual conversazione the meeting terminated.

“NESTS AND EGGS OF BIRDS FOUND BREEDING IN AUSTRALIA AND TASMANIA.”—The third and concluding part of the second volume of this special catalogue, issued by the Australian Museum, Sydney, has been published. In it the author, Mr. A. J. North, C.M.Z.S., Ornithologist to the Museum, deals with the nests and eggs of the remaining families of the order Passeres and a portion of the order Picariæ. Among these are included the swallows, finches, larks, lyre-birds, nightjars, and kingfishers. Numerous illustrations are given in the text, and a full plate is given of a nest of the Brown Kingfisher, *Dacelo gigas*, in a white ants' mound, placed in a tree, about 40 feet from the ground. This was from a photograph taken at Lindfield, N.S.W., ten years ago, where now the main street of a flourishing suburb is situated. Two plates of eggs, figuring 34 specimens belonging to 17 species, are given; these are all of natural size. As usual, Mr. North's notes are of a most interesting character, being culled from the experiences of collectors and observers in all parts of Australia.

EXCURSION TO GRAHAM FALLS, BELGRAVE.

THIS excursion was fixed for Cup Day (Tuesday, 2nd November), and, after having scanned the holiday crowd at Princes' Bridge railway station between 8.30 and 8.52 a.m. for additional naturalists, a party of Club members and their friends, numbering eight, left by the train at the later time for the first Club excursion to Graham Falls. These falls are situated in the Dandenong Ranges, and are approached from the Belgrave station, on the Gembrook line. *En route* another member was picked up at Canterbury. Between Box Hill and Belgrave some of our native plants growing adjacent to the railway line rendered themselves very noticeable by their profusion and beauty of bloom, the more prominent of them being *Leptospermum scoparium*, *Daviesia latifolia* and *D. corymbosa*, *Stylidium graminifolium*, *Dillwynia cinerascens* and *D. floribunda*, *Diurus pedunculata*, *Comespernum ericinum*, *Hibbertia stricta*, *Helichrysum scorpioides*, and *Melaleuca squarrosa*. At Ferntree Gully station, where we were delayed on the Gembrook train waiting for more passengers by later special trains from Melbourne, another member joined our party, and, on arrival at Belgrave at about 11.30 a.m., we found the total number of our company to be fourteen, which included the veteran excursionists, Messrs. Best, Frost, and Searle. Our course lay along the Monbulk road for a distance of about half a mile. Various buildings in process of erection indicated the growing popularity of this part of the narrow-gauge Gembrook line. As we proceeded attention was drawn to the distinctive mountain growth and beauty of many European trees growing in "Glen Harrow," the valuable property on the right-hand side of the road formerly held by Mr. Cole, a well-known nurseryman. The colour of the pink-flowering variety of *Crategus oxyacantha* was observed to be much more brilliant than in plants growing around Melbourne. Some fine specimen trees of the Blackwood, *Acacia melanoxylon*, among the various eucalypts, and some tall examples of *Alsophila australis*, the Hill Tree-fern, were to be seen close to the roadside prior to reaching the Monbulk Creek, which crosses the road at a little distance from where we turned off into the track which was to lead us to the Falls. Near the creek crossing the first prominent objects of interest were the two *Olearias*, *O. argophylla*, the Native Musk tree, and *O. stellulata*, which were covered with masses of their beautiful white blooms. Diverging from the road to the track on the left, we started along the latter, which was specially opened up at the beginning of last year to afford easy access for tourists and visitors to the Falls. After a very agreeable journey along this easily-graded, ascending path, on either side of which were the usual forest trees, shrubs, and ferns to be found on the slopes of most of the gullies in the Dandenong Ranges, we arrived at the camping grounds at the head of

Graham Falls at about half-past 12 p.m. *Papilio macleayanus* was the first butterfly noted by one of our party. Several well-known native birds and a few lizards were noticed in passing along. We decided to have lunch before inspecting the Falls and starting on the observation journey. So, boiling the billy in one of the special fire-places built for such purposes, tea was soon made. During luncheon some interesting reminiscences by some of the party of their doings at previous extended excursions were related, after which we started to descend to the base of the Falls down steps made in the siding, and which in some places were nearly perpendicular. During the past eighteen months, mainly through the instrumentality of the late Minister of Lands, Hon. J. E. Mackay, M.P., and the Surveyor-General of Victoria, Mr. J. M. Reed, I.S.O., the whole of the Monbulk Creek, from the Monbulk and Belgrave road to the head of the creek, a distance of between 4 and 5 miles, and its adjacent vegetation, have been opened up to view in a very careful and judicious manner by the ranger, Mr. J. O'Donoghue. Tracks have been cut, steps, rustic bridges, and seats placed at suitable spots; sign-posts indicating routes have been fixed at otherwise doubtful turnings, and pathways have been made more accessible, and all without undue destruction of the native vegetation. At the main crossing of the water of the falls, which were named Graham Falls after the former owner of property in their vicinity, a fine view is to be had of the full course of the several series of falls, forming a descent in all, as viewed from this crossing, of from 60 to 70 feet. A densely furnished grove of the Tree-ferns, *Dicksonia Antarctica*, extending far down, is noticeable from where we crossed the water and passed over from the east to the west side of the valley. These ferns a little lower down were found to be well clothed with *Polypodium*, *Trichomanes*, and *Hymenophyllum* ferns as well as with the mosses *Dawsonia superba* and *Porstrichum decurvatum*. As we ascended along the zig-zag path, formed with an easy gradient, a fine view of the east bank of the creek, rising up to 200 feet, presented itself. The usual vegetation of our mountain gullies, such as Native Sassafras, *Atherosperma moschata*, Blackwood trees, *Hedycarya Cunninghamii*, *Zieria Smithii*, Native Hazel, Musk, *Senecio Bedfordiana* (Blanket Tree), *Coprosma Billiardieri*, Olearias, and Peppermint, Blackbutt, Blue Gum, and other eucalypts, with giant specimens of the two principal tree-ferns, *Dicksonia* and *Alsophila*, sending out their profusion of new frondage, are so grouped or massed here as to make a fine picture, well worth travelling so far to conveniently inspect. As we journeyed along the well-devised, fairly level track for about a mile and a half, some fine examples of eucalypts were very noticeable, numbers of them rising from 150 to 200 feet, and

having large girths of stem for a great height. One giant specimen, which is dead, and must have been lying there for a number of years unobserved, has recently been made an object of interest to passers-by along the track, owing to its having been opened up to view and a footbridge built on to its bole. We tape-measured this specimen and found the diameter of its uprooted stem-base to be 14 feet. At 32 feet from its base the stem circumference measured 28 feet 6 inches, and the length of stem along which persons may walk proved to be 165 feet; the diameter at that distance from the base being 2 feet. Adjacent to this specimen is a living one, which, at a height of as far as we could reach, was found to have a stem circumference of 22 feet. Within a short distance from these giants some large and splendid examples of Blackwood and Silver Wattle (*Acacia dealbata*), were observed, many of the latter reaching to a height of 60 feet, with stems of nearly 18 inches diameter. Three isolated patches of tea-tree, of a species yet to be accurately determined, were noticed in the broad bed of the creek near here, where, also, was passed through one of the densest groves of *Dicksonia* tree-ferns seen during the day. The tea-tree specimens referred to were taller than most of those in our party had ever observed before, being from 40 to 50 feet in height. We reached the source of the creek, close to the Sherbrooke road, at a distance of about a quarter of a mile from where it branches from the Ferntree Gully road. At the head of the creek were again found some large Blackwood trees and dense undergrowths of *Olearia stellulata* in full bloom, interspersed with tree-ferns. Some strong-growing young plants were a puzzle for a time to determine, owing to their rank growth and undeveloped flower-heads; these were proved by maturer specimens found later to be *Pimelea ligustrina*. Another monster dead Eucalyptus was seen lying close to the track leading out to Ferntree Gully road; the stem measurement of this one was found to be over 160 feet, with an average diameter of over 4 feet. On the journey from the Falls to the head of the creek several members were engaged in searching for entomological specimens and noting the various birds observed. The following plants, in addition to those already mentioned, were found to be in flower:—*Cassinia aculeata*, *Helichrysum ferrugineum*, *Senecio vagus*, *Stellaria flaccida*, *Drosera Menziesii*, *Pimelea axiflora*, *Lomatia Fraseri*, *Asperula Gunnii*, *Glycine clandestina*, *Ranunculus lappaceus*, *Hibbertia stricta*, and *Geranium dissectum*.

At a quarter to 4 p.m. we started on the journey of about $3\frac{1}{2}$ miles along the road to Ferntree Gully, noting very few plants in flower other than those already mentioned. *Clematis aristata* was, however, commencing to fully bloom, and *Diplarrhena morcea*, while the *Acacias stricta*, *leprosa*, and *verticillata* were

still found in flower. Being such a beautiful day as it was, and comparatively clear, fine panoramic and landscape views of Western Port and Port Phillip Bays, Arthur's Seat, Upper Beaconsfield, and the intervening country were greatly admired as we sauntered along the road. We arrived at the foot of Fern-tree Gully about half-past 5 p.m., and after resting for half an hour, during which some tea and refreshments were again liberally provided by the ladies of the party, we strolled along to the station by half-past 6 p.m. as a united party, still numbering 14. Having seated ourselves in one of the luxurious (?) cattle-trucks provided for passenger traffic at holiday time on this line, we were soon being taken to our respective stations, after an outing which by its length prevented us searching any spots more than cursorily, but which nevertheless opened up to some of the party visions of fresh hunting grounds, and which had been to one and all, according to their expressions, a most enjoyable and pleasant excursion.

Mr. C. Oke has furnished the accompanying list and note re the entomology of the excursion. He says:—"The principal Coleoptera taken were:—*Ceneus chalybeipennis*, Chaud.; *Melobasis nervosa*, Bois.; *Melobasis* (sp.); *Ethon corpulentus*, Bohem.; *Chrosis trisulcata*, Erich.; *Chrosis* (sp.); *Crepidomenus fulgidus*, Erich.; *C. decoratus*, Erich.; *Monocrepidius*; *Apasis howitti*, Pasc.; *Lepispilus sulcicollis*, Pasc.; *Lepispilus* (sp.); *Æsiotes morosus*, Pasc.; *Poropterus conifer*, Erich.; *Aoplocnemis armipennis*, Lea; *Ecrizothis* (sp.); *Belus bimaculatus*, Pasc.; *Rhachiodes granulifer*, Chev.; *Ectosticta ornata*, Blk.; *Stenoderus suturalis*; *S. concolor*; *Leperina decorata*, Erich.; *Cordus hospes*, Germ., and *Heteromastix galeatus*, Blk. These have been kindly identified for me by the National Museum. The only butterflies I noticed were the Painted Lady, *Pyrameis kershawi*, and the Admiral (*P. itea*). Moths were scarce, a few *Agrotis* being the only ones noticed."—F. PITCHER.

A GRAND OLD GUM TREE.—It is gratifying to record that at length a spirit of veneration for the remains of our native flora is being exhibited in some quarters. The people of Ivanhoe, at the instance of Mr. and Mrs. A. B. Woolf, are endeavouring to raise a fund to purchase the allotment at the junction of the Upper Plenty and Studley Roads, Ivanhoe, on which stands a grand old red-gum tree. This tree, which was illustrated in the *Australasian* of Saturday, 4th December, is probably at least 500 years old, and should, with protection, live as many more. Should the effort be successful, it is proposed to make the Heidelberg Shire Council the custodian of the land, and its occupant. The Committee of the Field Naturalists' Club of Victoria, in order to further the movement, at its last meeting voted a guinea to the fund.

PROGRESS REPORT OF THE WORK OF THE PLANT RECORDS SUB-COMMITTEE.

(Presented to Field Naturalists' Club of Victoria, 11th Oct., 1909.)

THE Sub-committee for Plant Names, appointed in August, 1907, is now more than two years in being.

So far it has not apparently justified its existence, for no results of its labours have yet been published. To show, however, that it has not been idle, it has been considered advisable by the committee that some explanation in the nature of a progress report should be given to members—and this perhaps more appropriately on the night of our annual wild-flower show than on another occasion—so that an idea may be formed of the work already done, and of what still remains to be accomplished.

To advance arguments urging the necessity for popular names for our plants seems somewhat superfluous, but as there are still people, and among them some of the scientific botanists, who unmistakably set their faces against the use of the vernacular, perhaps a few may be permitted.

The late Baron von Mueller, in speaking of the Ranuncles in his "Introduction to Botanic Teachings," says:—"Rational teaching should discourage these superfluous appellations, which are vague, carry not beyond one language, and are almost useless burdens to the memory." He goes on, however, to observe that if the plant needs interpretation at all, then the literal translation of the scientific name would be best.

In opposition to this opinion there are some who, while grudgingly admitting the recognition of such popular names as already have vogue—that is, those names which have come gradually, naturally, and inevitably into existence—would deprecate the cold-blooded invention of other popular names.

But, granting that the existence of popular names would induce a greater number of people to *commence to interest themselves* in our flora, and a greater number of those now slightly interested to extend their interest in it further, even these manufactured names would seem to be fully justified. Scientific names may be safely left to those who have already acquired a more or less complete knowledge of their subject, and, after all, they are for international rather than for local use. One might even go to the length of saying that for the people inhabiting the country in which the plants occur the popular names are far more important than the scientific, which are, when not actually misleading, in many cases mere labels without any suggestiveness whatever.

Our president tacitly acknowledged this when he recently dubbed an unoffending plant *Gilruthia Osburni*. Even if we

take a shining example of scientific nomenclature, one that is definitive both in its generic and specific parts, such as *Zygophyllum apiculatum*—translated by the sub-committee into “peaked twin-leaf”—surely it will at once be admitted that while the former name might scare the beginner from any further consideration of the plant, the vernacular would very likely commend itself to him, and have a very good chance of being remembered. It may further be said, in the case of the invented names, that in the future such as are found wanting will doubtless be displaced by others more suggestive, more appropriate, or more poetic. Notwithstanding, then, most eminent disapproval, it was felt that until the species of our flora were fitted like the birds with single, fixed, and as far as possible, appropriate popular names, the general interest which the Club naturally desires to stimulate would continue to languish.

The objects of the sub-committee, at first more modest, and aiming only to deal with the commoner species, in addition to the collection of data necessary for the formation of a floral calendar, now includes in its scope all the members of our flora.

So far the greatest confusion obtains in such popular nomenclature as already exists. The great majority of our plants, and among these are the best known Hibbertias, almost all of the Goodenias and Pultenæas, the Cryptandras and Grevilleas—to name only a few genera—do not possess a name of any sort. Other species, and most notably the eucalypts, are, on the other hand, cursed with names galore. Some, like *E. pauciflora*, *E. amygdalina*, *E. hamastoma*, *E. paniculata*, *E. leucoxydon*, *E. botryoides*, *E. goniocalyx*, *E. Stuartiana*, *E. rostrata*, and *E. viminalis*, have a dozen names or more apiece, and current in as many different localities. In this genus twelve of the species found in Victoria are known, in one place or another, as white gums, nine as blue gums, seven as red gums, an equal number as swamp gums; and such appellations as cabbage gum, mountain ash, peppermint, stringybark, box, ironbark, messmate, blackbutt, and woollybutt seem to have been indiscriminately applied, in some cases to a few, in other cases to many members of this important group, with the result, as we all know, that here confusion is worse confounded. Species in other genera, again, from some fancied resemblance to old-world plants, have been given the popular names of these, with the objectionable “native” prefixed, and we have accordingly such absurdities as Native Fuchsia for *Correa speciosa*, Native Mignonette for one of the Stackhousias, and Native Wallflower for Pultenæa!

In short, most of our plants have no popular names at all, others have names too many, others only such designations as are obviously inappropriate and misleading, and the minority alone—and of these the bulk are species occurring also in other countries—have names which have seemed worthy of retention.

The work of the sub-committee, then, has been and still is to find names for those plants not possessing any, to choose the best when many are in use, and to find a better when the only one current is deemed unfit for adoption.

To obtain as great an amount of material as possible, lists of names have been widely solicited through the *Naturalist*; by means of notes in the *Teachers' Gazette*—the Education Department being so much in sympathy with our objects that it nominated Messrs. H. B. Williamson, J. P. M'Lennan, and W. H. Callister to act with the sub-committee; in the daily press, and by special appeal in certain directions.

To further the sub-committee's object a "Recording Census" was issued by Professor Ewart at the beginning of the year, and this has been sent to all those who have been thought likely to afford us the information desired. This census is still available to those wishing to help in the matter, and on application to the National Herbarium a copy will be forwarded. In addition, the various works dealing with Australian plants, as well as other volumes, have been ransacked for matter.

The result of this appeal has been somewhat discouraging, though there is still hope that in the copies of the census not yet returned much useful help may be obtained. Gratifying returns have been already received from some of the schools and from, in particular, Messrs. Leonard Rodway (Government Botanist of Tasmania), St. Eloy D'Alton, H. B. Williamson, J. P. M'Lennan, and Vroland, Dr. Morrison (of Perth), and Mr. W. R. Guilfoyle, who consented to become a member of the sub-committee, but was unfortunately prevented through illness from attending any of its meetings. Of these eleven have been held, when more than 700 names were considered and provisionally adopted, and, judging from the names remaining in hand and still undealt with, it would seem easy to find suitable vernaculars for another 300 species.

In view of the fact that perhaps more than 300 plants are common to all the States of Australia, or to these and Tasmania, and that so many of the Victorian forms occur in one or more of the other States, it was very soon agreed that an early understanding with the botanical authorities there would be a matter of much importance and particularly desirable, so that the names ultimately adopted might receive the widest possible recognition. In order to secure this desirable agreement, the various Government Botanists were communicated with, and satisfactory replies were received from Messrs. J. H. Maiden, Leonard Rodway, and Dr. Morrison. As a result of this the sub-committee is working in complete harmony with Mr. J. H. Maiden, of Sydney, and the names of species occurring also in New South Wales will not be adopted without his approval. Also we have the assurance

of the two other gentlemen named that the vernaculars agreed upon will have their recognition and also that of their States in as far as their efforts can secure it.

In this regard it only remains to be said that on a recent visit to Sydney Dr. Ewart conferred with Mr. Maiden, with the result that finality was arrived at in the matter of the majority of the 700 names provisionally adopted, so that these may now be published as a first draft of our work.

Before actually dealing with the plant-naming, the sub-committee laid down certain principles for its guidance, and these have been adhered to as closely as possible.

The one that naturally first suggested itself was that the old-world name, or one or other of them where several existed, should be adopted in the case of those species occurring both here and in the old country, and that this rule should also apply to common genera which were not, however, represented by identical species in both places. In this category are nearly 100 species, and about 150 genera. Some examples which may be mentioned are—Smaller Mousetail for *Myosurus minimus*, Sea Rocket for *Cakile maritima*, Smooth Sea-heath for *Frankenia laevis*, Yellow Woodsorrel for *Oxalis corniculata*; and, among the genera, the buttercups (*Ranunculus*), sundews (*Drosera*), starworts (*Stellarias*), goosefoots (*Chenopodium*), docks (*Rumex*), knotweeds (*Polygonum*), brambles (*Rubus*), pennyworts (*Hydrocotyle*), woodruffs (*Asperula*), cudweeds (*Gnaphalium*), speedwells (*Veronica*), eyebrights (*Euphrasia*), bladderworts (*Utricularia*), mints (*Mentha*), germanders (*Teucrium*), duckweeds (*Lemna*), &c.

The next rule is that the substantive name should be the same for all members of a genus where possible. For example, having fixed on sundew for *Drosera*, we would have the Desert Sundew, *D. indica*, Alpine Sundew, *D. Arcturi*, Forked Sundew, *D. binata*, Scented Sundew, *D. Whittakeri*, Climbing Sundew, *D. Menziesii*, and so on.

Where suitable aboriginal names are already in use and are seemingly fitting, they have been retained, so that hereafter we may have Bolwarra designating *Eupomatia laurina*; Wilga, *Geijera parviflora*; Mulga, *Acacia aneura*; Yarran, *A. homalophylla*; Burgan, *Kunzea peduncularis*; Waratah, *Telopea oreales*; Boobi-alla, *Myoporum insulare*; Berrigan, *Eremophila longifolia*; Quandong for the Santalums, and Geebung for the Persoonias.

Again, it was decided that when the scientific name was in popular use—*Clematis*, *Aster*, *Pittosporum*, *Boronia*, *Acacia*, *Myosotis*; when its brevity or euphony recommended it—*Correa*, *Hovea*, *Vallisneria*; or when great difficulty was experienced in finding or inventing a name for a genus, such as *Eriostemon*, the scientific name should be retained.

It was also decided that no popular names should be admitted if these are the scientific names for other and widely different plants. This, while barring Native Fuchsia for *Correa speciosa*, has not prevented Southern Sassafras for *Atherosperma moschatum*, and the inconsistency may be excused when it is remembered that while the Onagraceæ are far removed from the Rutaceæ, the Lauraceæ and the Monimiaceæ are closely related. When close kinship can be claimed with the plants of another genus, the old-world popular name for this has been sometimes chosen, as in the case of Austral Hollyhock for *Lavatera plebeja*, Bentham pointing out the very slight difference between *Althæa* and *Lavatera*. A few more examples of the naming, taken from the list more or less at random, may be quoted here. *Commersonia Fraseri* is Blackfellows' Hemp; *Amperea spartioides*, Broom Spurge; the Pimeleas, rice-flowers. In the leguminosæ the Gompholobiums are bladder peas; Sphærolobiums, globe pods; Daviesias, bitter peas; Pultenæas, bush peas; Dillwynias, parrot peas; Platyllobiums, flat peas; Swainsonias, darling peas; Psoraleas, scurfy peas; Kennedyas, coral peas; the Leptospermums are tea-trees, the Callistemons bottle-brushes, and the Melaleucas paper-barks; *Craspedia Richea* is Billy-buttons; *Cotula coronopifolia*, Water-buttons; the Centipedas, sneeze-weeds; the Candolleas, trigger-plants; *Brunonia australis* is Blue Pincushion; the Corysanthes are red helmets, *Cyrtostylis reniformis* the Mosquito Orchid, the Patersonias purple flags, *Drymophila cyanocarpa* Turquoise Berry, Burchardia milkmaids, Calcectasia Blue Tinsel Lily.

From the foregoing it will be gathered that quite a fair amount of work has already been done, about half of our total species having been more or less satisfactorily dealt with. In dealing with the remainder many difficulties which have been shirked so far will have to be overcome. Very naturally the easier part was first tackled, and in finishing the work, which will, no doubt, occupy the sub-committee for another couple of years at least, the assistance of every plant-lover in the club will be needed. None of these should fail to send in the completest possible list. Even if only one of the names suggested is deemed worthy the contribution will not have been made in vain. In instancing some of the most difficult genera and species it may be asked—How are the Hibbertias, the Bæckeas, the Pomaderris, the Cryptandras, the Grevilleas, the Coprosmas, Lomatias, and Conospermums to be known? If the Helichrysums are called everlasting, how shall we name the Helipterums? What names are worthy for the charming myrtaceous plants *Lhotzkya genetylloides*, *Thryptomene Mitchelliana*, and *Bæckea crenatifolia*, for *Dampiera stricta*, for the curious Mitrasacmes, and the malodorous Opercularias? Can anyone suggest a better name for the Prostantheras than mint

bushes? Among the Composites, where are hosts of difficulties, appellatives will be welcomed for *Minuria*, *Vittadinia*, *Podolepis*, *Leptorrhynchos*, and others, as also for the members of the Epacrid and the orchid family. Many other queries might be put, but these are perhaps sufficient to indicate where assistance is most needed, and will, it is hoped, have some effect in so stimulating the energies of members that quite a crop of suggestions will soon be available to enable this most important work of plant naming to be brought to an early completion.—C. S. SUTTON, Hon. Sec. Plant Names Sub-Committee.

NEW AND RARE AUSTRALIAN BUTTERFLIES OF THE GENUS MILETUS.

BY G. A. WATERHOUSE, B.Sc., B.E., F.E.S., AND G. LYELL, F.E.S.
(Read before the Field Naturalists' Club of Victoria, 8th Nov., 1909.)

IN the "Transactions of the Entomological Society of London" for 1891, Mr. H. H. Druce published a monograph of the then known species of this beautiful genus, under the generic name *Hypochrysops*. Since that date many new species have been described, the greater number by Grose Smith in the "Rhopalocera Exotica." Two new Australian species were described and the others listed by one of us in the "Proceedings Linnean Society, New South Wales," 1903. We have now to make known three more beautiful forms, and to give a full description of the lately re-discovered, strikingly handsome *Miletus apollo*.

Druce (*loc.*) divides the genus into three sections, with the following characters and typical species:—

Section I.—Costa of fore-wing arched: veins 2 and 3 of hind-wing produced to blunt tails. *M. polycletus*.

Section II.—Apex of fore-wing pointed; hind-wing more produced at tornus than at apex. *M. ignita*.

Section III.—Costa of fore-wing arched: hind-wing more produced at apex than at tornus. *M. theon*.

For the present we are allowing *Miletus apollo* to remain in this genus, though we have no doubt it will be removed when the family is again monographed; it needs a fourth section.

Section IV.—Costa of fore-wing almost straight; hind-wing more produced at tornus than at apex, veins 1 and 2 produced to blunt tails; cell of hind-wing above (in the male) with long hairs. *M. apollo*.

The first, third, and fourth sections are readily distinguished, being small and easily defined groups: the first and third are but geographic modifications of a single widely-ranging form. The second section contains a number of widely dissimilar species, and may yet, for the purposes of systematic work, have to be divided

into several sub-sections ; in Australia these would be represented by *M. narcissus*, *M. ignita*, *M. delicia*, *M. meleagris*, *M. apelles*, *M. miskini*, and *M. elgneri*.

MILETUS APOLLO, Miskin, Annals Queensland Museum, No. 1, Supplement, 1891.

This particularly handsome species was provisionally described from a very poor male specimen (Miskin supposed it to be a female—both head and abdomen were missing) found by Mr. R. E. Turner between the leaves of a book, with some other butterflies from the Herbert River, Queensland. This damaged type (the remains of which are now in the Queensland Museum) was the only example known till in 1907 those in our possession were taken by Mr. H. Elgner. We now describe the female for the first time, and give fuller and more accurate details of the male ; even with the good specimens now available the extremely complicated pattern-scheme of the under-surface makes the description a difficult one.

Male.—Fore-wing : length of costa 20 mm. ; costa nearly straight ; apex acute ; termen and dorsum of equal length, straight. Hind-wing : produced to blunt teeth at veins 1, 2, and 3.

Above.—Fore-wing : orange-red ; apical area to costa at third and narrowly to tornus black. Hind-wing : orange-red ; cell and dorsal area between veins 1 and 2 covered with long hairs orange-red ; dorsum narrowly cream ; cilia orange-red, at veins 1, 2, and 3 black.

Beneath.—Fore-wing : dorsal half, extending just into cell, pale orange ; cell red, with two \cap -shaped cream marks upon a central black streak ; apical third, extending to two-thirds of termen and as a dark line only to tornus, reddish-brown ; a series of irregular sub-apical interneural marks cream ; a streak along upper edge of cell metallic ; a sub-terminal line of dots metallic. Hind-wing : apical two-fifths red-brown, shading towards costa to red ; tornal three-fifths cream, with obscure markings orange ; costa at base red, inwardly edged black ; a small streak on costa beyond base, and a spot on costa close to apex, cream ; three spots between cell and costa cream, basal one narrow, outer one larger, round, outer two edged black below ; a narrow band through cell, reaching middle of dorsum, scarlet ; a discal band from vein 6 to 1a at two-thirds scarlet ; these two bands edged black towards dorsum ; terminal band orange, with median line metallic and inner line black ; cream spots and scarlet bands sparingly edged metallic ; two spots in basal portion of cell, two in wide central portion of discal scarlet band, and one close to costal cream spot at apex, metallic ; all metallic lines and spots silver in some lights and pale blue or green in others ; cilia orange, at veins 1, 2, and 3 black.

Female.—Fore-wing: length of costa 21 mm.; costa more arched and apex less acute than in male; termen convex. Hind-wing: produced to very blunt teeth at veins 1, 2, and 3.

Above.—Fore-wing: reddish-orange (several shades lighter than the male); apical area broader than in male, extending further along costa, right to tornus, and one-fourth along dorsum, black. Hind-wing: reddish-orange; a sub-apical area from just below vein 6 to above vein 7 black; an irregular, obscure, interrupted sub-terminal band between veins 1 and 4 black; cilia reddish-orange, at veins 1, 2, and 3 black.

Beneath.—As in male, but slightly paler; cream areas a little broader; scarlet bands and metallic scalings a little narrower.

Four males and four females. Type male in collection Miskin, Queensland Museum; type female in collection Waterhouse.

Localities.—Cape York, Jan., Mar., May, June, Sept., Oct., Dec. Prince of Wales Is., June.

Miskin describes the colour as "wholly bright ferruginous." The male in some lights is almost vermilion; we consider orange-red, or orange-heavily-dusted-with-red, describes it accurately; abdomen, thorax, and head, as well as the clubs of the antennæ, are all this colour; the antennæ are brown, and more than half the length of the costa.

The male of *M. apollo* is of similar shape to the figure of *M. chrysargyra* of Grose Smith, but the colour and markings of that figure above are more like the female than the male of *M. apollo*; beneath, the two species are widely different.

MILETUS PANÆTHA, n. sp.

Male.—Fore-wing: narrow; length of costa, 16 to 19 mm.

Above. — Fore-wing: brilliant blue; costa and termen narrowly and apex broadly rich black; a central streak from near base along lower third of cell and beyond, but not reaching black termen, obscurely white. Hind-wing: brilliant blue; costa obscurely white, at base dull black; termen narrowly rich black; apical area between veins 6 and 7 rich black; abdominal fold obscurely white; cilia white, at veins black. Abdomen dull black, ringed white.

Beneath. — Fore-wing: creamy-white; sub-costal band and sub-apical broad band rich black narrowly edged metallic-green; costa, apex, and termen narrowly dull black; sub-terminal interrupted line metallic-green. Hind-wing: rich metallic-green, crossed by three oblique bands of rich black; first from base to vein 8 at half; second from dorsum at third to vein 6, thence to apex dull black; third from vein 1a at two-thirds to vein 4; a broad terminal band rich black, with a central broad line brilliant metallic-green; costa narrowly white; between first and second black bands a broader band from middle of cell to costa near apex white; cilia white, at veins black. Abdomen white.

Female.—Fore-wing : narrow ; length of costa 20 mm.

Above.—Fore-wing : dull black ; central fourth of wing white dusted at edges dull metallic-blue ; base and dorsum dusted dull metallic-blue. Hind-wing : dull black ; costa obscurely white, at base dull black ; base and dorsum dusted dull metallic-blue ; cilia white, at veins black. Abdomen dull black, ringed white.

Beneath.—As in male.

Nine males and two females. Types in collection Waterhouse ; co-types in collection Lyell. We have presented a male to the British Museum.

Locality.—Cape York (Elgner), March, June, Sept., Nov., Dec.

This brilliant species is quite distinct from all other Australian *Miletus*. Superficially it is more like *Danis arinia* (Australian form of *D. cyanea*), but is much brighter blue above, and has larger green and black areas beneath.

M. panatha is the Australian representative of *M. theon*, of Felder, from Gilolo, one of the Moluccas Is. For comparison with our form we have to rely upon Druce's figure of *M. theon* ("Transactions Entomological Society, London," 1891, pl. xi., figs. 9, 10, male). According to this the male of *M. theon* above is a rather lighter blue ; the dark margins are broader, especially at apex of fore-wing ; the central white streak of fore-wing is larger, extending below cell ; beneath the metallic-green areas are less extensive and the black bands more restricted ; first black band is more oblique, reaching vein 8 before half ; third is interrupted near centre ; the white band widens considerably towards apex and *extends to dorsum* ; the terminal black band is inwardly edged narrowly and obscurely white. The male of *M. hippuris* of Hewitson, from the Aru Is., as figured by Druce (*l.c.*, pl. xi., figs. 11, 12) is an allied form much paler blue above ; beneath it has smaller areas of both black and metallic-green, and a consequently larger area of white ; white band of hind-wing reaches dorsum ; sub-terminal white line is present, and clearer than in *M. theon*. *M. theonides* (female) of Grose Smith and *M. carmen* (male) of Grose-Smith, both from Ron, New Guinea, we believe to be sexes of one species ; in both the yellow and white band of hind-wing beneath extends to the dorsum. The male of *M. theophanes*, of Grose Smith (figured "Rhopalocera Exotica," 1895), from Humboldt Bay, New Guinea, has a purplish central area to both wings above, that of fore-wing enclosing the white streak, and narrower black margins ; beneath the black bands of hind-wing are narrower ; the second and third join towards the apex ; the green dorsal portion of white band is replaced by a black spot. The male of *M. alix* of Grose Smith (figured "Rhopalocera Exotica," 1900), from Milne Bay, New Guinea, has no white streak on fore-wing above, and beneath the white area of hind-wing is larger and the green and black areas are smaller.

MILETUS ELGNERI, n. sp.

Male.—Fore-wing: length of costa 17 to 19 mm.; same shape as *M. ignita*, larger; veins 1 and 2 of hind-wing slightly more produced.

Above.—Fore-wing: dull purple (shining purple in some lights); costa narrowly, apex broadly, and termen narrowly and evenly brown-black; cilia brown, towards tornus narrowly whitish. Hind-wing: dull purple; costa and termen dark brown; dorsum brown; cilia narrowly whitish, at veins brown.

Beneath.—Fore-wing: ashy-brown, dorsal and tornal areas sometimes darker; upper half of cell and short bars from centre and at end of cell orange-brown; discal band from costa at three-fourths towards termen at two-thirds red-brown; discal band and cell area and bars narrowly edged brown-black, and sometimes faintly edged metallic-blue; a narrow sub-terminal line metallic-blue, inwardly edged near apex with three black dots. Hind-wing: ashy brown, with a series of red-brown spots as follows—2 on dorsum, 2 in interspace 1*a* (lower one concave outwardly), 3 in interspace 1 (lowest one concave inwardly and middle one elongate), 2 in interspace 2, 1 in interspace 3, an elongate spot across interspaces 4 and 5, 1 in interspace 6, 3 in interspace 7, a costal streak near base, 2 irregular elongate spots crossing cell and a third marking end of cell; these red-brown markings all narrowly margined brown-black, and sometimes faintly outwardly edged metallic-blue; inner sub-terminal line dark brown dusted metallic-blue; outer sub-terminal line metallic-blue; terminal line orange, with dark dots at veins, largest at vein 2.

Female.—Fore-wing: length of costa 17 to 20 mm.; termen more rounded than in male.

Above.—Fore-wing: brown-black; central area orange, shading at base and along basal half of dorsum to golden-brown. Hind-wing: golden-brown, towards costa brown; cilia narrowly whitish, at veins brown.

Beneath.—Fore-wing: central area orange; base and tornus brown; rest of wing grey; markings as in male. Hind-wing: grey; spots and markings as in male, but light purple-brown instead of red-brown; tornal area with heavier metallic-blue scalings.

23 males, 13 females. Types in collection Waterhouse; co-types in collection Lyell. We have presented a male and a female to the British Museum.

Localities.—Prince of Wales Is., May, June, July.

We have pleasure in naming this species after Mr. H. Elgner, whose efforts have resulted in the addition of several new *Lycænids* to the Australian list.

The male of this very distinct species is dull-coloured for a

Miletus; beneath the metallic markings are less conspicuous than is usual in the genus, and the red-brown spots of the hind-wing are also of a dull tone. The female, with its central orange area of fore-wing above, is a handsomer butterfly, at first glance recalling female *Ogyris ianthis*, or a larger form of female *Miletus hecalius*; beneath it is paler than the male, and the tints are more delicate.

M. elgneri may be readily distinguished from other species of the *M. ignita* section by the discal band of fore-wing beneath. Only in this species and in *M. narcissus* does this band run from the costa towards the tornus; the corresponding band in the other species of the section runs parallel with the termen. From *M. narcissus* it is abundantly distinct in size, colour, and markings.

MILETUS ERYTHRINA, n. sp.

Male.—Length of costa of fore-wing 15 to 16 mm.; shape as in male *M. ignita*.

Above.—Shining bluish-purple, shading to dull brown at margins; base of costa of fore-wing coppery; brown costal margin of hind-wing not (as in *M. ignita*) reaching sub-costal vein; terminal line brown-black, internally at veins 1, 2, 3, and 4 coppery; cilia whitish.

Beneath.—Stone-grey (much paler than in *M. ignita*); coloured spots and bands in same positions but distinctly smaller and more heavily margined metallic-green; costa cell and sub-terminal line of fore-wing orange (paler than in *M. ignita*); sub-terminal line of hind-wing orange (in *M. ignita* red); otherwise as in *M. ignita*.

Female.—Length of costa of fore-wing 14 to 16 mm.; shape as in female *M. ignita*.

Above.—Fore-wing: shining blue; base of costa coppery; costa and apex broadly dull brown; termen broadly and obscurely brown; bar at end of cell brown-black; terminal line brown-black; cilia whitish. Hind-wing: shining bluish-purple (paler and brighter than in male); costa broadly dull brown extending to sub-costal vein and along vein 7 to termen; terminal line brown-black, internally at veins 1, 2, 3, and 4 coppery; cilia whitish.

Beneath.—Paler than in male; red bands and metallic lines and margins brighter and broader than in male.

Three males and two females. Types in collection Lyell; co-types in collection Waterhouse.

Locality.—Port Darwin (F. P. Dodd), Feb., March.

This race of *M. ignita* is more clearly differentiated from the typical form than any we have yet seen. It is easily distinguished above by the narrower dark margins and the brighter purple of the male, and by the narrower dark margins, paler blue of the fore-wing, and the difference in the colours of the fore-wing and the hind-wing of the female. Beneath the ground-colour is a

grey rather than the brown of *M. ignita*, and the metallic margins of the coloured spots are much more conspicuous.

M. chrysonotus of Grose Smith ("Rhopalocera Exotica," 1899, pl. xlix.) described from a single female from Cooktown, is, in our opinion, but a slight variety of *M. ignita*; we have a female from Cape York and another from Kuranda, but no male has yet been taken, and that sex is needed to prove its identity with the typical *M. ignita*.

Typical *M. ignita*, according to the original description by Leach, has portions of the veins of the hind-wing marked with copper. The types came from the neighbourhood of Sydney, and the usual Sydney form is thus marked, though specimens with the copper absent are by no means uncommon in New South Wales and Victoria.

M. olliffi is evidently intended by Miskin to apply to that form of *M. ignita* in which the coppery markings of veins are absent, but the locality of the type is unfortunately uncertain—"Newcastle, N.S.W., and Fremantle, W.A." The probable type (a male) is still in the Australian Museum, but is without a locality label; above it is of a slightly different shade of purple, has more clearly defined dark margins, and has an obscure bluish tornal patch on the hind-wing; beneath the ground colour is different, the spots are narrower, and the spot between veins 6 and 7 of the hind-wing is much nearer the termen; but the position of this spot is by no means constant in *M. ignita*. Pending further material from Western Australia we think it best to consider this specimen an individual aberration of *M. ignita*.

We have a male and a female from Brisbane that differ from typical *M. ignita* in being very highly coloured beneath. From Mackay we have two females much larger than, but otherwise almost identical with, *M. erythrina*, but here again we need the male to confirm our opinion. From Mackay we have a male, and from Sandgate a female, for which, in the absence of further examples, we hesitate to claim specific rank; they have the pale spots beneath very narrow, and the coloured sub-terminal band of fore-wing beneath is on the inner instead of the outer side of the sub-terminal interrupted line of metallic spots; they form a connecting link between the purple *M. ignita* and the bronze purple *M. epicurus*.

GEOLOGICAL MAP OF VICTORIA.—A new geological map of Victoria, on the scale of 16 miles to 1 inch, has just been issued by the Mines Department, at the nominal price of one shilling. Owing to the adoption of a larger scale, it has been possible to include more details than hitherto, hence the usefulness of the map is greatly increased.

PLATE II.



FIG. 1.



FIG. 2.

VOLUTA MAMILLA, GRAY.

PLATE III.



FIG. 3.



FIG. 4.



FIG. 5.

VOLUTA MAMILLA, GRAY.

FIRST RECORD OF THE ANIMAL OF *VOLUTA*
MAMILLA, GRAY; WITH REMARKS THEREON.

BY J. H. GATLIFF and C. J. GABRIEL.

(Read before the Field Naturalists' Club of Victoria, 8th Nov., 1909.)

HAVING learnt that the Commonwealth trawler *Endeavour* had obtained examples of *Voluta mamilla*, Gray, with the animal living, we wrote asking the Director of Fisheries, Mr. H. C. Dannevig, if he would be kind enough to furnish us with a specimen so that we might obtain the radula. This he consented to do, and upon the return from the last trawling trip to Gabo Island, Mr. Burfield, the marine biologist of the vessel, handed us two specimens with the animal living. A solution equivalent to sea-water was made, and the shells were immersed in it for some time in the hope that the animal would crawl, and a photograph of it would then have been taken; but some days had elapsed since they had been obtained, and our effort was unsuccessful, so we had a photograph taken of the animal *in situ*, and two others of it after extraction, in different positions, as shown in the accompanying plates.

We selected the smaller specimen for investigation. The portion discernible within the aperture was of a salmon-pink colour. We extracted the radula; it is very small, the length being 23 mm. and breadth at the middle 1.55 mm.; breadth of dental area at same place 1.1 mm., with 95 three-cusped rachidian teeth.

The protoconch of both shells was absent, having broken away, evidently owing to the excavations made in the test by a spongy mass that was adhering to the dorsum.

From the evidence that we have been enabled to collate it is most probable that south-east Australia may be considered to be the metropolis of this species, and this is the first record respecting the animal.

The photographs of the shell and animal have been kindly done for us by Mr. W. D. Nicholas, and the radula by Mr. F. Chapman, A.L.S., of the National Museum, Melbourne.

The specimens were obtained by the Commonwealth trawler *Endeavour*, 15 miles south-west of Gabo Island, Victoria, in 30 fathoms. The specimen photographed is—length 230, breadth 120 mm.; and the other one is larger.

Referring to the sponge mentioned above, Mr. F. Chapman has kindly furnished us with the following note:—"A boring sponge of the family Suberitidæ (or Clionidæ), differing from the genus *Cliona* in the extreme rarity of the pin-shaped spicules, the megasclera being of the form of slender, smooth, and spinulose spicules, with an occasional barbed spicule. Related to the

genus *Pione*, from which it differs in the absence of the undulose microscleres."

EXPLANATION OF PLATES.

PLATE II.

Animal of *Voluta mamilla*, Gray.

Figs. 1 and 2.—Opposite views of same individual (about half natural size).

PLATE III.

Voluta mamilla, Gray.

Fig. 3.—Shell containing animal *in situ* (about half natural size).

Fig. 4.—Radula, $\times 5$.

Fig. 5.—Radula, $\times 34$.

NOTES ON THE HAIRY-NOSED WOMBAT,

PHASCOLOMYS LATIFRONS, OWEN.

By J. A. KERSHAW, F.E.S., Curator of Zoology, National Museum. (Read before the Field Naturalists' Club of Victoria, 8th Nov., 1909.) Two species of wombats exist at the present time in Australia—viz., the Common Wombat, *Phascolomys mitchelli*, Owen, found in South Australia, Victoria, and New South Wales, and the Hairy-nosed Wombat, *Phascolomys latifrons*, Owen, hitherto believed to be restricted to South Australia.*

In the course of an examination of the excellent series of wombats in the National Museum collection my attention was directed to three skins and a stuffed specimen of *P. latifrons* labelled Deniliquin, New South Wales. On looking up the record of the specimens, I found they were obtained from Mr. Louis A. Peers, of Deniliquin, N.S.W., on the 21st April, 1884.

As this was the first record which had come under my notice of this species occurring outside South Australia, some doubt was felt as to whether these specimens had actually been captured in Deniliquin, or had been brought from South Australia and forwarded to the Museum from there.

Inquiries were made regarding the possibility of securing further specimens, with a view to establishing beyond doubt its occurrence in this locality. My efforts have so far been unsuccessful; in fact, from the particulars obtained there seems every probability that these animals have been altogether eradicated from the district.

I was fortunate, however, in ascertaining Mr. Peers's address, and in reply to my communication he very kindly furnished me with the following particulars concerning the specimens, for which I desire to express my thanks.

Mr. Peers wrote as follows:—"Regarding the four wombat skins sent by me to the National Museum in 1884, I beg to say that I obtained them in New South Wales, and will give you all

* Mr. C. W. De Vis (Ann. Queens. Mus., No. 5, p. 14, 1900), described and figured a n. sp. of Wombat allied to *P. latifrons*, from St. George, Queensland, under the name of *P. gillespiei*.

the particulars. I was the first to call the late Professor M'Coy's attention to them. When I found the burrows (large camps half a mile long and about three or four chains wide) in a very secluded part of the country, I at once set about securing specimens. Upon examination I found they differed from the South Australian specimens in several little points. The nose was not quite the same, and the skull appeared to me to be shorter and the head rounder. The hair was of the same fine texture, but varied very much in colour. There were also a fair number of black ones among them. When I obtained the specimens you have, the late Mr. A. Morton, of the Hobart Museum, went with me to secure skulls with the brain preserved for examination by the late Professor Owen. I left New South Wales soon after 1884, and so lost the run of things, and never heard what decision was arrived at. . . . Where those wombats were found was, at that time, a very out-of-the-way place and the area was comparative small. I knew all the country round in every direction, and never found any traces of them outside this area. . . . To give you an idea of the area in question, refer to a map of New South Wales for the western boundary of the county of Denison, and carry that north to Billa-bong Creek, then east to the 146th meridian, then south to the latitude of Deniliquin, making that the southern boundary; the enclosed area is (or was) the habitat of these wombats. I am satisfied there were none to be found anywhere else in that or any other part of New South Wales. . . ."

The above particulars, so kindly furnished by Mr. Peers, and agreeing in every respect with those in the Museum records, establish without any doubt the occurrence of this species in this district. Its distribution must therefore be extended to southern New South Wales.

BOOK NOTICE.

THE WEEDS, POISON PLANTS, AND NATURALIZED ALIENS OF VICTORIA. By Alfred J. Ewart, D.Sc., Ph.D., F.L.S., Government Botanist and Professor of Botany in the University of Melbourne, assisted by J. R. Tovey, Assistant National Herbarium, Melbourne. Melbourne: J. Kemp, Government Printer. 1909. Price, 2s. 6d.

The author has divided this work of 110 pages into two parts. In the first part he deals systematically with the poisonous, injurious, and proclaimed weeds (native or introduced) of the State, but, before taking the different orders of plants *seriatim*, points out in a general introduction the various causes which lead to the spread of injurious or useless plants, and methods by which much of the trouble they cause could be obviated. The

remarks as to the folly of indiscriminate clearing of timbered land are particularly pertinent, and it is to be hoped that some attention will be given to the author's suggestions. Those plants which contain poisonous principles in such quantities as to be dangerous to man or animal are specially marked. In the detailed account of the commoner weeds the different species are dealt with under their natural orders, and the coloured plates of the proclaimed plants, which have appeared from time to time in the *Journal of Agriculture*, are inserted in their proper places. The notes about the plants are necessarily very brief, and require a little botanical knowledge on the part of the reader, as illustrations of each species would have made the cost of the volume excessive. The second part is devoted to a "Census of the Naturalized Aliens of Victoria," amounting to 364 species. Of each the scientific name, common name, natural order, date and place of publication of first record of naturalization, local distribution and original home, and character is given. A useful glossary of technical terms is a thoughtful addition, while a very full index completes a work which, though necessarily of a technical character, is full of useful information for the grazier and the agriculturist.

CULTIVATION OF NATIVE PLANTS.—Attention was called in the *Australasian* of 13th Nov. to the efforts made by Mr. A. Rutter Clarke, of Merriwa, Orrong-road, Toorak, to establish a native plant section in his garden. A large variety of eucalypts, acacias, and other flowering shrubs have been planted, and are doing remarkably well. It is to be hoped his example will be followed by others, and so dispel the idea that the members of our native flora are not worth garden room. In the same paper of 4th December Mr. G. Weindorfer, of Kindred, Tasmania, relates his experience with numerous native plants which he is endeavouring to establish round his homestead. Several interesting coniferous plants, removed from Cradle Mountain, Tasmania's highest mountain, appear to be thriving in their lowland situation.

WERRIBEE GORGE.—The pupils of the Melbourne Continuation School, to the number of about 550, made one of their periodical excursions for Nature Study on Friday, 12th November, when Werribee Gorge was visited. His Excellency the Governor, Sir T. Gibson-Carmichael, K.C.M.G., the Director of Education, Mr. F. Tate, M.A., and other education authorities accompanied the party, and invitations were extended to several members of the Field Naturalists' Club, who were desirous of seeing how an excursion of such large dimensions was managed. The outing proved to be a most enjoyable and instructive one for all concerned, and was carried through without a hitch.

The Victorian Naturalist.

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FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly of the Club was held at the Royal Society's Hall on Monday evening, 13th December, 1909.

The president, Prof. A. J. Ewart, D.Sc., occupied the chair, and about 50 members and visitors were present.

CORRESPONDENCE.

From Mr. A. B. Woolf, Ivanhoe, acknowledging contribution to the fund for the purchase of the old red gum tree at Ivanhoe, and thanking the Club for its interest in the movement.

REPORTS.

A report of the three days' excursion to Toolangi, from Saturday, 13th, to Monday, 15th November, was given by the leader, Mr. F. G. A. Barnard, who reported a very interesting outing. Owing to the very dry spring, objects of interest were not as plentiful as had been expected, but members were enabled to make a rough survey of the district, which will be useful for future excursions. Birds were fairly numerous, about thirty-two species having been noted. Among flowering plants, *Prostanthera melissifolia*, with lilac flowers, in full bloom, was greatly admired. Insects were rather scarce, though several interesting beetles were captured. A fine series of mosses, &c., was secured in the fern gullies. Fine weather prevailed during the outing, and the middle portion of Myers Creek was suggested as a suitable place for a future excursion.

A report of the excursion to the Botanical Gardens on Saturday, 27th November, was forwarded by the leader, Mr. F. Pitcher, who reported a fair attendance of members. A demonstration was given in the Museum of the development of the flowers and fruit of the banana; then the border of Australian vegetation was visited, and a Western Australian eucalypt, *Eucalyptus erythronema*, with bright magenta-coloured flowers, flowering for the first time in the Gardens, was much admired. The orchid houses and nurseries were visited, also the nymphaea lake and palm ground; afterwards an inspection was made of the recently formed promontories and marginal beds of the main lake.

A report of the excursion to Willsmere, Kew, on Saturday, 11th December, was given by the leaders, Messrs. W. and J. Stickland. They reported a fine afternoon and a good attendance of members. The water in the lagoons was found to contain large numbers of rotifers, among which the genus *Laciniaria* was represented by clusters of *L. socialis*, *L. pedunculata*, and *L. elliptica*. Immense numbers were present of

Notops brachionus, a rotifer, interesting on account of its close resemblance to the genus *Brachionus*, which, however, belongs to an entirely different family. *Conochilus volvox*, a clustering form, was also taken. A small pool was found to be quite green with a species of *Euglena*. Entomostraca were unusually scarce, as if the season had not been suitable for them.

A report of the junior excursion to Cheltenham on Saturday, 4th December, was forwarded by the leader, Mr. C. French, jun., who reported a poor attendance of juniors, doubtless owing to the very showery weather experienced. The afternoon was devoted to insect life, and a number of interesting galls, larvæ of longicorn beetles, case-moths, &c., were collected.

ELECTION OF MEMBERS.

On a ballot being taken, Miss Bury, State school, St. Kilda Park, Mr. J. Barr, 39 Queen-street, Melbourne, Mr. R. H. M. Eltis, Livingstone-street, Ivanhoe, and Mr. J. H. Owen, State Parliament House, were elected as ordinary members; Rev. A. J. Greenwood, Smythesdale, as a country member; Miss Evelyn Pepperell and Mr. Spencer Pepperell, Burwood-road, Hawthorn, as associate members; and Master S. Anderson, 99 Charles-street, Ascot Vale, as a junior member of the Club.

GENERAL BUSINESS.

In accordance with notice, Mr. A. J. Campbell, M.B.O.U., moved—"That this Club take some action to prevent bark-stripping from wattle trees on the Yarra banks, particularly in the neighbourhood of Heidelberg and Eltham."

The mover pointed out that the beauty of the scenery along the Yarra, particularly near Heidelberg and Eltham, was being sadly marred by the practice of stripping the wattle trees for their bark, and suggested that an endeavour be made to persuade the owners of property along the river banks to protect the wattles. The motion was seconded by Mr. D. Best, who thought that the land-owners might be approached by means of a suitably worded circular. The motion was carried.

Mr. A. J. Campbell, M.B.O.U., then moved—"That this Club aid in the promotion of a national 'Wattle Day.'"

The mover referred to the movement recently initiated in Sydney for the adoption of a national Wattle Day, and thought this Club should take some steps to further the idea in Victoria.

The chairman thought that the *Eucalyptus* rather than the *Acacia* should be adopted as the national flower, for, while the former genus was almost restricted to Australia, many species of *Acacia* occurred in Africa and the Asiatic islands.

Mr. A. D. Hardy, F.L.S., also favoured the *Eucalyptus*; Mr. G. Coghill supported the idea, and the motion, on being seconded by Mr. D. Best, was adopted.

PAPERS READ.

1. By Mr. A. J. North, C.M.Z.S., entitled "Description of a new Genus and Species of Honey-eater from Western Australia."

The author stated that he had recently received for examination from Mr. H. L. White, of Scone, N.S.W., some skins of a honey-eater, obtained at Lake Way, Western Australia, which differed sufficiently from recognized species to require a new genus, which he had called *Lacustroica*, to be constituted for it, while the bird itself he named *Lacustroica Whitei*, in honour of Mr. Alfred H. E. White, a son of Mr. H. L. White, who is proving himself an enthusiastic ornithologist. The species is very modestly plumaged, and in that respect resembles *Entomophila albigularis* and *E. rufigularis*.

Mr. G. A. Keartland said that the Lake Way district was a fine ornithological region, and would probably furnish other novelties.

2. By Prof. A. J. Ewart, D.Sc., entitled "The Biological Survey of Wilson's Promontory—Second Report."

The author stated that the recent visit of Mr. Audas and party from the National Herbarium to the Sealers' Cove district of the National Park had resulted in the addition of nearly two hundred additional species to the known flora; some of these, however, were introduced aliens. An interesting find was the fern *Lindsaya trichomanoides*, the first record for Victoria, though found in New South Wales and Tasmania. He also read a more detailed report by Mr. Audas, and some notes by Dr. C. S. Sutton, who was one of the party. With a visit to the north-eastern corner of the Park the botanical portion of the survey would be completed. This, it was hoped, would be undertaken at an early date.

NATURAL HISTORY NOTE.

Dr. T. S. Hall, M.A., stated that an eel fare had recently been witnessed on the Hopkins River, near Warrnambool, and that specimens of the young eels (elvers) were now on view, alive, at the National Museum.

EXHIBITS.

By Mr. J. W. Collings.—An onyx and moss-agate, from Aberystwyth, Wales.

By Mr. F. P. Spry.—Australian ants belonging to genus *Podomyrma*; rare beetles from Western Australia—*Megacephala blackburni*, Fleutiaux, *M. castelnauvi*, Sloane, and *Cunipectus frenchi*, Sloane; rare butterfly, *Dodonidia helmsi*, Fereday, from New Zealand.

By Messrs. W. and J. Stickland.—Colonies of rotifers, under the microscope, including *Lacinularia pedunculata*, *L. elliptica*, and *L. socialis*, from Willsmere excursion.

After the usual conversazione the meeting terminated.

UNGARNERED GRAIN.

By T. S. HALL, M.A., D.Sc.

(Read before the Field Naturalists' Club of Victoria, 8th Nov., 1909.)

IN the course of some remarks made before the Club a few years ago,* I sketched the causes which led to its foundation, and and pointed out that as long as the Club fulfilled the conditions which brought about its existence so long would the type of its membership continue. It was formed first and foremost for the study of natural history in the open air. We are field naturalists.

Among the members of a club which contains such large numbers as ours does there will always be a certain proportion whose inclinations lean more towards what we may call laboratory work. But, relatively, their numbers are small. It is the living butterfly, the nesting bird, and the flower of the field that we are chiefly interested in, and there is enough in the study of what we see on our rambles, and can examine by the wayside, fully to occupy the time that most of our members can give to the study of nature.

I should be very sorry indeed to think that all our members should look on an earthworm as merely an object to be cunningly pickled and then cut into innumerable sections for microscopic study. I would not regard it as an advancement of science if all our members thought that the only way to study birds is to skin them and to describe minutely the variations of a few tints on their feathers. I should hold it to be disastrous for the growth of knowledge if all our botanists lost their tempers over the question of the name of a purple-flowering weed.

These and a host of kindred questions must be studied, and answers must be given; but do not let the people who deal in these things destroy our taste for simple food. Are we to forget the pleasure in the pathless wood, or the breezy call of incense-breathing morn? Are we to take no joy in the way of a bird in the air or of a fish in the sea? Are the cyanide bottle, the collecting jar, the vasculum, or the geological hammer to be our tyrants and not our slaves? Worse, and still worse, are we bound to describe what we see and tell what we think we know in a hideous jargon of scientific terms? Are we to be condemned to wander for the rest of our days on dissected pene-plains gathering Cerambycidae or Stylidiids and generally miscalling technicalities? Why, if in springtime we go to the You Yangs, should we imagine ourselves climbing over quartz mica diorite or worse and looking at *Bos taurus* and *Ovis aries* being chased by *Canis familiaris*? All these things have their place, and Mesopotamia is a blessed word; but if you make up your mind to it you can do a great deal with the English language. Technical terms are necessary—sometimes. There are ideas that cannot readily be expressed without their aid, and objects that cannot be

* Presidential Address, 1902, *Vict. Nat.*, xix., p. 44, July, 1902.

indicated without their use. But don't mistake the glib use of polysyllables for knowledge.

In spite of the views of some people who should know better, there is a very large amount of scientific work, especially in natural history, that lends itself admirably to treatment by amateurs, and which need not be obscured by scientific verbiage. There is a mean in all things, even in the use of technical terms. The English language is flexible and elastic; its vocabulary is enormous, and the neglect to express one's views in simple terms, but to prefer to use technical ones, is frequently a form of laziness and carelessness that everyone should guard against. If there are two ways of expressing an idea, take the simple one, and you will find it harder to cheat yourself into believing you understand it and can communicate it to others.

Anyone who has had any teaching experience, or who has tried to explain some scientific fact to his friends, knows well how wonderfully his ideas are clarified by the necessity of translating into simple English some thought that he thinks he understands when clothed in technical terms. A wise man long ago said, "By teaching shalt thou learn."

Science deals with facts and ideas, and is not concerned with modes of expression. Clarify your ideas and your language will to a large extent look after itself.

But I did not intend to write rules for English composition. I meant to point out some work that is awaiting the doing. Some of it can be done by members of this Club, and we can publish their results. Much of it I, for my own part, would like to see presented to some other society, and in its fulness published elsewhere. I say this, not because I want to harm the Club to which I owe so much, but because I wish it well, and do not desire to see its digestion ruined by strong meats and strong drinks and its keenness blunted by listening to papers it cannot follow.

A good deal of what I have just said I dealt with in the address previously mentioned, and in that address I further pointed out some work that wanted doing. I am glad to say that my words on that occasion directed the energies of one or two people into definite channels, with excellent results. I venture, therefore, to point out some further requirements, and to ask for help.

Our protozoa, the minute life of our ponds, is still neglected. "Pond-lifers" gather it, and look at it, and guess at a few names, and I hope there will always be nature-lovers who will do so. But will someone carefully investigate any one group of these animals? There is an enormous field for research in the study of the distribution of the protozoa. Besides, it is a reproach that we have no one who can name them.

In Victoria we have given too little attention to our fresh-water sponges; and surely we have more than a couple of genera of fresh-water hydrozoa. Can anyone say whether we have a fresh-

water medusoid or not? Then there are the terrestrial and fresh-water turbellarian worms, of which planarians form a group. Intestinal parasites and earth-worms are being attended to elsewhere, but we can afford to have more workers, or, at any rate, more collectors. Our leeches and polyzoa surely can yield fresh forms to the investigator, but whether they do or not their study will well repay anyone who undertakes it.

Among insects there is a wide field, but just now what we specially want to know about are our blood-sucking flies, Culicidæ, and other Diptera. These are great carriers of disease, and attention all over the world is being concentrated on them. Then come the centipedes and millepedes, which are of considerable interest, but which have been greatly neglected here.

Our spiders are fairly well known, but someone on the spot should be able to identify them readily. One of our members many years ago accumulated a great deal of information about the spinning of their webs, but could not be induced to publish anything. With photography to help the naturalist, the difficulties of illustration to a large extent vanish, and I know of only one Australian worker.

As to our land and fresh-water mollusca, again, we in Victoria are sadly in the dark. Collecting has been done in the south-west of the State, but the rest is a blank. The way has been made clear just lately for anyone who will take up the task. The group is not a large one, and will well repay a few years' patient research, and we would welcome a careful worker here.

In addressing ourselves to the crustacea we are on most promising ground. The discovery of Koonunga threw a brilliant shaft of light on dark places in the classification of this group, and Koonunga is not likely to be the sole representative of its family. Many strange, old-fashioned beasts have been discovered among our fresh-water crustacea, and probably as many more remain undetected. Why should we think for a moment that the new species and genera discovered on a few summer afternoon rambles exhaust the possibilities of our mountain valleys to the north and east? What treasures lie yet hidden in the salt and fresh-water lakes of the Western District! Has a tow-net or even a dip-net yet stirred their depths? Are we to wait till they are drained or turned into sewage tanks before we attempt their exploration? The reed-beds are daily being reclaimed, and their rich fauna and flora is passing away for ever.

When we come to the vertebrates we are at once confronted with problems of a different kind. There is not the same insistent call for the systematist. Nearly everything probably has been identified as far as land and fresh-water forms are concerned. But we want to know much of their ways of life. We want observations and records of the breeding habits of the eel and of our so-called mountain-trout (*Galaxias*). What absolute

proof is there of the spawning of the latter in fresh water? Can anybody find the ova in the water, then see the newly-hatched young, and trace the stages of growth. We want facts, not opinions based on what occurs somewhere else.

The European eel breeds in the depths of the sea below 500 fathoms. Perhaps our eel does so too, but does anyone know that it does? Give us facts. Anyone who will settle either of these questions will gather much that is of value on other subjects by the way, and add at least one important stone to the cairn of knowledge.

There is a good deal to be learned of the breeding of our land frogs. Do they require water during their metamorphosis or not? Our reptiles are well known, but the recent discovery close to Melbourne of several specimens of a snake new to Victoria shows that we should take nothing for granted. The same may be said of our birds and mammals, but no one would be surprised at the finding of a new species in the Gippsland ranges or in the Otways. Our rats, be it remarked, are still very imperfectly known, and are passing away, and our bats are probably in the same unsatisfactory condition. We want lists and named collections of all these things, and we will have to hasten if we are to get them.

I will just cross the threshold of botany and indicate a few places in which enthusiasts may aid the cause of science. We want a good series of photographs of all our plants—trees, shrubs, and herbs. We want pictures of our wild flowers—the single plant in flower. Don't aim at pretty pictures; aim at representing the typical plant. Then we want plant-grouping studied and photographed. What plants are associated together in certain situations and on certain soils? There are long names for these studies, but you need not know the names in order to do good work. The studies are older than the names, and will continue when the names are forgotten.

One other fruitful field of research in regard to our native plants may be drawn attention to, and that is the methods by which insects transfer the pollen from anther to stigma. What a delightful exhibit at our meeting would be a photograph of the visit of an insect to a trigger-plant. If you can't get a photograph, will you describe what happens? What actual insect is in the habit of visiting this flower, and how does he work? But the trigger-plant is one of many. Who will do for Victorian orchids what Darwin did for the English ones? We know practically nothing of this great question of pollination among our plants. It is field naturalists' work.

Still another botanical question suggests itself. What are the effects of changed conditions on our native plants? Why, for instance, are some specimens of *Bursaria* more spinose than others? Why does the character of the bark of some of our eucalypts change with change of locality? Read Schimper's

"Plant Geography," and ask yourself a host of other questions of a similar nature that need answering, and many of which anyone who really tries can reply to.

I have propounded a series of problems that will keep the Club busy for many a day, and I wish to emphasise the fact that because we are members of a Club the way is prepared for anyone to attempt to answer some of these questions. If you want to know where to go to find your specimens, how to preserve them, how to store them, how to manage breeding boxes or aquaria, or where to see the literature that may be necessary to start you on your path of discovery, there is some one or other in the Club who can satisfy your wants, and will be only too glad to do so. Ask! There is no need to send the bellman round announcing the fact that you are preparing to begin, nor is there any necessity for you to attempt to rush into print before you have accumulated some carefully tested observations. Don't baulk the end half-won for an instant dole of praise.

I have sought to direct observation to our fresh-water and land forms, because it is they that are rapidly passing away with the onrush of civilization. The marine forms of life need investigation, too, but they can wait, as they have waited for ages past. The land fauna and flora, however, must be studied by this generation or it will be too late to answer many of the questions that will be asked concerning it by those who come after us. Some of it has already perished.

What I have said I should like to qualify by one remark. I fully recognize that the great bulk of our members have neither time, opportunity, nor inclination to undertake work such as I have indicated. They have to remain satisfied with what they gather on our excursions or at our meetings, but it must be remembered that this is what all of us have to do when subjects outside our own special ones, if we have any, are being dealt with in the Club. The Club needs the support of all its members, whether they are original investigators or not. All I ask is that a dozen or so will devote some of their spare time seriously to some problem that requires settling, or will do something, however small, to help on the knowledge of natural history in our State. Everyone can help. Everyone can do something to open up the path to fuller knowledge. There will be difficulties and disappointments to face. After careful work has brought you to the knowledge of some fact, quite possibly you will find that you have been forestalled. But you will have learned the joy of research, and will be fitted to cope with some new problem that will speedily present itself. If you are puzzled about the choice of a subject, let me recommend the lines—

"Do the work that's nearest,
Though it's dull at times."

There is no need to go to the polar regions for a subject. It lies here, under your hand.

BIOLOGICAL SURVEY OF WILSON'S PROMONTORY.

SECOND REPORT,* BY ALFRED J. EWART, D.Sc., Ph.D., F.L.S.

(Read before the Field Naturalists' Club of Victoria, 13th Dec., 1909.)

IN continuance of the work begun last year, and in fulfilment of the instructions received from the Hon. G. Graham, Minister for Agriculture, the National Herbarium sent a second expedition to the National Park last October (1909), the members being Mr. J. W. Audas, of the National Herbarium, Mr. P. R. H. St. John, of the Botanic Gardens, and Dr. Sutton, hon. secretary of the Plant Names and Records Committee. The expedition confined its energies to the east coast of the Promontory, which hitherto has been little explored botanically, and, after a fortnight's work, only a small area remains to be covered. A third visit should practically complete the botanical part of the survey, and enable a handbook to the flora of the Park to be issued as soon as the pressure of official duties permits.

It is greatly to be regretted that the vermin-proof fence, promised by the Government in response to the representations of the National Park Committee, has not yet been erected across the neck of the peninsula. Rabbits do not as yet appear to have entered the Park, for although Mount Hunter is full of burrows on its south-eastern slopes no rabbit traces were seen, and the burrows are probably formed by some other animal. Should rabbits once enter, the value of the Park as a sanctuary for the native flora will become very small, and its value as a sanctuary for our native animals will be considerably decreased. I desire to urge the practical importance of immediately erecting the vermin-proof fence if the Park is to fulfil the functions for which it was set aside.

A few details in regard to the plants recorded are worthy of note. The fern, *Lindsaya trichomanoides*, was previously only known from Tasmania and New South Wales. This is the third species of Victorian plant whose sole locality is in the National Park, and probably as time goes on and the native flora disappears from the rest of Victoria the number of such cases will steadily increase.

The record 331, *Tetratheca ericinum*, Sm., in the previous list (*Vict. Nat.*, xxv., p. 148), should have been *T. ericifolia*, which is now to be given as *T. pilosa*, Lab. (a broad-leaved form). Mueller placed *T. pilosa* as a variety of *T. ericifolia*, although Bentham, vol. i., p. 131, quotes Mueller as doing the opposite—i.e., placing *T. ericifolia* as a variety of *T. pilosa*. It seems best to maintain the two species as distinct ones. The type, *T. ericifolia*, is therefore not as yet recorded from the Park, but a

* For First Report, with map, see *Victorian Naturalist*, vol. xxv., p. 412 (January, 1909).

variety of it, var. *rubicoides*, occurs on the Vereker Range, which is the only Victorian locality for this plant. The new additions include 18 naturalized aliens, the total number of aliens recorded from the Park now being 42, of which three (Spear Thistle, Cape Weed, Bathurst Burr) are proclaimed plants. The total recorded native flora is 558, so that $\frac{1}{13}$ are aliens, whereas no less than one-fourth of the general Victorian flora consists of aliens. So long as cattle-grazing continues in the Park, the native flora will continue to suffer and weeds to spread; but until a vermin-proof fence has been erected it is impossible to keep cattle out of the Park.

The Native Beech, *Fagus Cunninghami*, was not seen during the present trip. The fires appear to have killed it out except in one small locality, where it was found by the Ranger, but which was not visited, owing to lack of time. One plant recorded on the preceding list on the authority of others—namely, *Kunzea peduncularis*—was not seen, and is probably an error for *K. corifolia*, which is common.

A shrubby *Grevillea* has been added to the flora, and the following orders now have representatives in the Park:—Callitrichinæ, Jasmineæ, Loranthaceæ, Lytharieæ. So that of the 111 natural orders of the Victorian flora only 27 are still unrepresented in the Park flora.

PLANTS COLLECTED OCTOBER, 1909, NOT PREVIOUSLY RECORDED FOR THE NATIONAL PARK:—

Introduced plants marked *.

<i>Acacia juniperina</i> , Willd.	...	...	Mt. Hunter
„ <i>verticillata</i> , Willd., var. <i>ovoidea</i> , Benth.	...	...	Vereker Range
<i>Asplenium flabellifolium</i> , Cav.	...	...	Lilypilly Gully
<i>Atherosperma moschata</i> , Labill.	...	...	Sealers' Cove
<i>Atriplex cinerea</i> , Poir.	...	...	„
<i>Bossiaea cinerea</i> , R. Br.	...	...	Mt. Hunter
<i>Brachycome cardiocarpa</i> , F. v. M.	...	...	Near Vereker Range
„ <i>stricta</i> , D. C.	...	...	Mt. Hunter
<i>Brachyloma ciliatum</i> , Benth.	...	...	„
* <i>Bromus mollis</i> , L.	...	...	Biddy's Camp, Seaforth
* „ <i>sterilis</i> , L.	...	...	Darby River
* „ <i>unioloides</i> , H. B. et K.	...	...	Near Seaforth
<i>Cæsia parviflora</i> , R. Br.	...	...	Three-Mile Beach
<i>Caladenia congesta</i> , R. Br.	...	...	Barry's Creek
„ <i>deformis</i> , R. Br.	...	...	Leonard Range (Ranger)
„ <i>latifolia</i> , R. Br.	...	...	„
„ <i>suaveolens</i> , Reichb. f.	...	...	Mt. Hunter
<i>Callitriche Muellieri</i> , Sond.	...	...	Near Vereker Range
<i>Calystegia Soldanella</i> , L.	...	...	Three-Mile Beach
<i>Carex cæspitosa</i> , L., var. <i>Gaudichaudiana</i> , Kunth.	...	...	Vereker Range
„ <i>paniculata</i> , L.	...	...	„
<i>Cassutha glabella</i> , R. Br.	...	...	Near Mt. Hunter
„ <i>melantha</i> , R. Br.	...	...	Barry's Creek

Casuarina distyla, Vent., var. pros- trata, Maiden & Betche	...	...	Barry's Creek
Caustis pentandra, R. Br.	...	...	Three-Mile Beach
*Cerastium vulgatum, L.	...	...	Biddy's Camp, Seaforth
Chamaecilla corymbosa, F. v. M.	...	...	Near Vereker Range
Chiloglottis Gunnii, Lindl.	...	...	Sealers' Cove
Claytonia Australasica, Hook., f.	...	...	Near Vereker Range
Colobanthus Billardieri, Fenzl.	...	...	Three-Mile Beach
Convolvulus erubescens, Sims	...	...	Near Vereker Range
Cryptostylis longifolia, R. Br.	...	...	Near Barry's Creek
Cyathodes acerosa, R. Br.	...	...	Mt. Hunter
Cyrtostylis reniformis, R. Br.	...	...	Three-Mile Beach
Daviesia latifolia, R. Br.	...	...	Vereker Range
Deyeuxia minor, Benth.	...	...	Biddy's Camp, Seaforth
„ quadriseta, Benth.	...	...	„
Dianella Tasmanica, Hook f.	...	...	Sealers' Cove
Dichelachne crinita, Hook f.	...	...	Mt. Singapore
Dichondra repens, Forst.	...	...	Near Vereker Range
Dipodium punctatum, R. Br.	...	...	Sealers' Cove
Diuris pedunculata, R. Br.	...	...	Vereker Range
„ sulphurea, R. Br.	...	...	„
Drosera Menziesii, R. Br.	...	...	Barry's Creek
Elæocarpus reticulatus, Sm. (cyaneus, Sims)	...	...	Sealers' Cove
Epacris microphylla, R. Br.	...	...	Mt. Hunter
Erechtites quadridentata, D. C.	...	...	Sealers' Cove
Eucalyptus capitellata, Sm.	...	...	„
„ macrorrhyncha, F. v. M.	...	...	„
„ pilularis, Sm.	...	...	„
„ regnans, F. v. M.	...	...	„
*Festuca bromoides, L.	...	...	Mt. Singapore
„ littoralis, Labill.	...	...	Sealers' Cove
Gahnia psittacorum, Labill.	...	...	Vereker Range
„ radula, Benth.	...	...	„
„ trifida, Labill.	...	...	Barry's Creek
Gastrodia sesamoides, Benth. & Hook. f.	...	...	Near Three-Mile Beach
Glyceria dives, F. v. M.	...	...	Mt. Hunter
Gnaphalium luteo-album, L.	...	...	Near Darby River
Gratiola Peruviana, L., var. latifolia	...	...	Sealers' Cove
Grevillea lavandulacea, Schlecht.	...	...	Mt. Hunter
Hibbertia angustifolia, Salisbury	...	...	Vereker Range
„ Billardieri, F. v. M., var. mona- delpha	...	...	Sealers' Cove
„ virgata, R. Br.	...	...	Near Barry's Creek
*Hordeum murinum, L.	...	...	Darby River
Hovea heterophylla, A. Cunn.	...	...	Leonard Range
*Hypochaeris glabra, L.	...	...	Sealers' Cove
Hypolaena lateriflora, Benth.	...	...	Barry's Creek
Imperata arundinacea, Cyrilli	...	...	Mt. Singapore
Juncus bufonius, L.	...	...	Near Vereker Range
*Koeleria phleoides, Persoon	...	...	Darby River
Lasiopetalum dasyphyllum, Sieber	...	...	Mt. Singapore
Lepidium ruderales, L.	...	...	Sealers' Cove
Lepidosperma elatius, Labill.	...	...	„
„ gladiatum, Labill.	...	...	„
„ laterale	...	...	Near Barry's Creek
Limnanthemum crenatum, F. v. M.	...	...	Near Vereker Range
Lindsaya trichomanoides, Dryader	...	...	Lillypilly Gully
Loranthus celastroides, Sieber	...	...	Barry's Hill

<i>Lythrum hyssopifolia</i> , L.	...	...	Near Leonard Range
* <i>Matricaria discoidea</i> , D. C.	...	...	Darby River
<i>Microseris Fosteri</i> , Hook. f.	...	...	Leonard Range
<i>Mitrasacme paradoxa</i> , R. Br.	...	...	Barry's Hill
<i>Monotoca elliptica</i> , R. Br.	...	..	Sealers' Cove
<i>Olearia myrsinoides</i> , F. v. M. var. <i>erubescens</i>	...	...	Leonard Range
<i>Panax sambucifolius</i> , Sieber. var. <i>angustifolius</i>	...	...	Vereker Range
* <i>Papaver Rhoëas</i> , L.	...	...	Near Darby River
<i>Phyllanthus thymoides</i> , Sieber	...	...	Mt. Singapore
<i>Phylloglossum Drummondii</i> , Kunze	...	...	Near Vereker Range
<i>Pimelea drupacea</i> , Labill.	...	...	Sealers' Cove
„ <i>phyllicoides</i> , Meissn.	...	...	Near Chinaman's Creek
<i>Plantago coronopus</i> , L.	...	...	Darby River
<i>Poa annua</i> , L.	...	...	„
<i>Polycarpon tetraphyllum</i> , L.	...	...	„
<i>Polypodium punctatum</i> , Thunb.	...	...	Sealers' Cove
<i>Polypompholyx tenella</i> , Lehmann	...	...	Near Chinaman's Creek
<i>Potamogeton crispus</i> , L.	...	...	Near Darby River
<i>Prasophyllum rufum</i> , R. Br.	...	...	Collected by Mueller in 1853
<i>Pteris falcata</i> , R. Br.	...	...	Lillypilly Gully
<i>Pterostylis concinna</i> , R. Br.	...	...	Leonard Range
„ <i>cucullata</i> , R. Br., var. <i>alpina</i>	...	...	„
„ <i>curta</i> , R. Br.	...	...	„
„ <i>nutans</i> , R. Br.	...	...	„
<i>Pultenæa villosa</i> , Willd.	...	...	Mt. Hunter
* <i>Ranunculus muricatus</i> , L.	...	...	Darby River
<i>Sagina apetala</i> , L.	...	...	Near Darby River
<i>Scævola Hookeri</i> , F. v. M.	...	...	Near Biddy's Camp, Seaforth
<i>Schizæa fistulosa</i> , Labill.	...	...	Near Vereker Range
<i>Schœnus apogon</i> , Roem. & Schult.	...	...	„
„ <i>nitens</i> , Poir., var. <i>major</i> , A. J. E.	...	...	Near Mt. Hunter
<i>Scirpus cartilagineus</i> , Spreng.	...	...	Near Vereker Range
<i>Solanum nigrum</i> , L.	...	...	Near Mt. Singapore
* <i>Sonchus oleraceus</i> , L.	...	...	Biddy's Camp, Seaforth
<i>Sowerbæa juncea</i> , Sm.	...	...	Near Barry's Creek
* <i>Stachys arvensis</i> , L.	...	...	Sealers' Cove
* <i>Stellaria media</i> , Cyrilli	...	...	Darby River
<i>Stipa semibarbata</i> , R. Br.	...	...	Near Mt. Singapore
„ <i>setacea</i> , R. Br.	...	...	„
<i>Stylidium perpusillum</i> , Hook. f.	...	...	Near Vereker Range
<i>Tecoma australis</i> , R. Br., var. <i>Latrobei</i>	...	...	Sealers' Cove
<i>Tetragonia expansa</i> , Murray	...	...	Biddy's Camp, Seaforth
„ <i>implexicaoma</i> , Hook. f.	...	...	„
<i>Tetratheca ericifolia</i> , Sm., var. <i>rubicoides</i>,	...	...	„
„ A. Cunn.	...	...	Vereker Range
„ <i>pilosa</i> , R. Br.	...	...	Collected by Mueller
<i>Thelymitra antennifera</i> , Hook. f.	...	...	Near Barry's Creek
„ <i>carnea</i> , R. Br.	...	...	Mt. Hunter
<i>Thysanotus Patersoni</i> , R. Br.	...	...	Near Mt. Singapore
<i>Tillæa macrantha</i> , Hook. f.	...	...	Darby River
* <i>Trifolium minus</i> , Rehlant	...	..	Near Vereker Range
* „ <i>tomentosum</i> , L.	...	..	Darby River
<i>Triglochin centrocarpa</i> , Hooker	...	...	Three-Mile Beach
<i>Utricularia lateriflora</i> , R. Br.	...	...	Near Vereker Range
* <i>Veronica arvensis</i> , L.	...	...	„
* <i>Vinca major</i> , L.	...	...	Darby River
<i>Xanthosia pusillus</i> , Bunge	...	...	Near Vereker Range

BOTANICAL REPORT, BY MR. J. W. AUDAS.

Our party of three—Dr. C. S. Sutton, Mr. P. R. H. St. John, and myself—arrived at Fish Creek railway station at 12.30 p.m. on Monday, 18th October, where Mr. J. F. Falls, a local resident, awaited our arrival with conveyances.

We were driven to the Park, as far as Darby River, reaching there at about 8 p.m., where we were very hospitably entertained for that night, and on other occasions, by Mr. and Mrs. Win. Miller, who are in charge of Mr. Falls' estate.

Next day the ridges of Vereker Range were examined. *Eucalyptus amygdalina*, *E. obliqua*, *E. viminalis*, and *E. Muelleriana* were plentiful; also the following—*Goodia lotifolia*, *Pultenaea mollis*, *P. daphnoides*, *P. scabra*, *Gahnia radula*, and *G. psittacorum*. Among the rocky declivities at the summit we found *Tetralochea ericifolia*, var. *rubioides*, A. Cunn., a new variety for Victoria.

On the mud flats between the range and the Darby River *Utricularia dichotoma* was very numerous in swamps, and in full bloom, with purple flowers, but some seen were perfectly white. *U. lateriflora*, a much smaller and rarer plant, was also found. Other more minute plants collected were *Drosera pygmaea*, *D. spathulata*, *Stylidium despectum*, *S. perpusillum*, and the lycopod *Phylloglossum Drummondii*.

The second day was spent in journeying from Darby River to the Tidal Creek, where we camped for the night. From here a track is now cut to within three miles of Sealers' Cove beach, where it joins the old tram line formerly used by the sawmillers. This new track, which was only recently completed, was carried out at the instance of the National Park Committee, under the supervision of Mr. C. M'Lennan, the park ranger, on whom it reflects great credit. In the vicinity of this track the Pilot-birds *Pycnoptilus floccosus*, are very numerous. Some of the hills have very steep gradients, and corduroy crossings had to be made over many of the deep and treacherous gullies. Weighty fallen timber had to be removed, and the Sedge, *Lepidosperma elatius*, and the "Wire-grass," *Tetrarrhena juncea*, both of which are very abundant here, must have given much trouble.

When the old tram track is repaired—it being now in a very dilapidated condition—it will be possible to ride on horseback right through to the beach at Sealers' Cove. The Committee, I understand, intend to repair the track at an early date. Though only about four years since this tram track was abandoned, it is surprising how quickly seedlings of *Eucalypti*, *Prostanthera*, and *Hedycarya* have sprung up, making it in places almost impassable.

On hills adjacent to the track the "hop-bush," *Goodenia ovata*, and the "fire-weeds," *Senecio velleioides*, *S. vagus*, and *Erechtites*

arguta, have grown luxuriantly since the last bush-fires. *Pimelea linifolia*, reaching a height of twelve feet, and *Hibbertia Billardieri*, var. *monadelphæ*, ten feet high, were also very numerous.

The trees attaining the greatest height at Sealers' Cove are the Blackbutts, *Eucalyptus pilularis*, some of which are probably 200 ft. high, with a circumference of 25 ft. at the lower part of the butt. Next in point of size are the Blue Gums, *E. globulus*, and the mountain form of the Manna Gum, *E. viminalis*.

The Stringybark, *E. macrorrhyncha*, also attains a great height. This species, though allied to other stringybarks, such as *E. capitellata* and *E. eugenoides*, can readily be distinguished from them by the shape of its fruit, by the quality of its wood, and by its rising to a considerable height before putting forth branches. *Eugenia Smithii*, and the Blackwood, *Acacia melanoxylon*, also reach great proportions. High up on some of the Blackwoods bunches of the parasitical mistletoe, *Loranthus celastroides*, were seen.

One specimen of the Mountain Holly, *Lomatia Fraseri*, measured 5 feet in circumference at a height of 6 feet from the ground. Other trees observed were the Sassafras, *Atherosperma moschatum*, which is often characterized as a beautiful aromatic tree; the Musk-tree, *Olearia argophyllus*, which is one of the largest of the few trees included in the large order of Compositæ, abounds; while the Mint-tree, *Prostanthera lasiantha*, its companion as the largest of the Labiata, is equally numerous.

Myrsine variabilis and *Hedycarya Cunninghamii*, although shrubs in most parts of Victoria, become fair-sized trees in the sheltered and well-watered gullies.

Only one shrub of *Pimelea drupacea* was seen during the present expedition, and it was found close to Sealers' Creek. There also was found *Monotoca elliptica*.

Among the shady woods were the Kangaroo-apple, *Solanum aviculare*; *Coprosma Billardieri*, commonly known as Wild Currant; and *Tecoma australis*, var. *Latrobei*, a twiner with beautiful white bell-shaped flowers.

The robust climber, *Lyonsia straminea*, was seen right at the top of the tall Blackwoods.

In the fern glens many graceful ferns, such as *Alsophila australis*, *Cyathea Cunninghamii*, and *Dicksonia antarctica*, reach great heights and dimensions. The noble King Fern, *Todea barbara*, rises to perfection from the streamlets which meander through the gullies.

On the stems of *Dicksonia antarctica* the peculiar epiphytal shrub, *Fieldia australis*, the only Australian representative of the order Gesneriaceæ, appeared in great abundance. This plant was also found growing on granite boulders and in the ground.

The fertility of the soil at Sealers' Cove is evidenced not only by the rapid growth of the indigenous vegetation, but also by the way in which European and Asiatic weeds are spreading. *Vicia sativa* was so much in evidence as to be almost a pest, while other aliens are establishing themselves, namely:—*Carduus lanceolatus*, *Cryptostemma calendulaceum*, *Hypochaeris glabra*, *H. radicata*, *Silene gallica*, and the so-called Stagger-weed, *Stachys arvensis*.

Returning from Sealers' Cove, we again reached the Darby River, from whence we journeyed along the north-eastern coast to Mt. Singapore. This journey occupied two days, and we passed through very interesting country, which is composed chiefly of heathy flats and swamps, which are in places very dangerous, and where great care is required in crossing.

The vegetation was densely overgrown with dwarf *Casuarina*, *Leptospermum*, *Melaleuca*, *Eucalypti*, *Acacia verticillata*, *Ricinocarpus*, *Sprengelia incarnata*, *Hakea nodosa*, *H. pugioniformis*, and *Pultenaea Gunnii*.

Of the monocotyledons, *Hypolaena lateriflora* and *Patersonia longiscapa* were very abundant in the very moist places, while numerous grass-like *Cyperaceæ*, *Juncaceæ*, and *Liliaceæ* were encountered, the most common of which being *Mesomelaena sphærocephala*, *Gahnia radula*, *G. psittacorum*, *Xanthorrhæa australis*, *X. minor*, *Juncus communis*, *J. pauciflorus*, *Lepidosperma concavum*, and *L. exaltatum*, associated with two species of Xerotes, *X. longifolia* and *X. Thunbergii*. Almost all of these are useless as food for domestic animals. A few grasses find a precarious existence, of which *Poa cæspitosa*, *Danthonia penicillata*, var. *setacea*, *Dichelachne crinita*, and *Stipa semibarbata* are the most conspicuous, together with the introduced *Festuca bromoides*, *F. rigida*, and *Kæleria phleoides*.

On the numerous granite ridges *Banksia serrata*, intermixed with dwarf eucalypts and various species of *Pultenaea*, form isolated groups of forest.

Along the beach the vegetation chiefly comprised the following:—*Correa alba*, *C. speciosa*, *Myoporum insulare*, *Alyxia buxifolia*, *Leucopogon Richei*, *Leptospermum lævigatum*, with an occasional *Casuarina stricta*.

A shrub dotting the open country at the foot of Barry's Hill is *Casuarina distyla*, var. *prostrata*, Maiden and Betche, which is new for Victoria. Higher up this hill we noted a Sea-Eagle and nest situated in a large *Eucalyptus obliqua*.

Reaching Mt. Singapore the following plants were noted:—*Lasiopetalum dasyphyllum*, *Dampiera stricta* (with lovely blue flowers showing to perfection), and *Kunzea corifolia*, the bloom of which attracted many species of Honey-eaters. The principal trees were *Eucalyptus obliqua*, *E. viminalis*, and *Casuarina stricta*.

On the flat between Mt. Singapore and Mt. Hunter the swamps

are very numerous, and the scrub was very dense in places. On crossing the ridge at the foot of Mt. Hunter the slope was so steep that the pack-horse lost his footing and rolled down fully 25 feet, from which awkward position he was with difficulty extricated.

At Mt. Hunter the vegetation on the north and western sides was very dwarfed, while on the east and southern slopes it was dense and luxuriant, consisting of *Pultencea daphnoides*, *P. mollis*, *P. scabra*, *P. villosa*, and *Grevillea lavandulacea*, which were intermixed with *Lycopodium densum*, *Gleichenia circinata*, *Sprengelia incarnata*, *Correa speciosa*, *Hedycarya*, *Prostanthera*, *Olearia argophyllum*, *Pomaderris apetala*, and *Gahnia psittacorum*. Beneath this almost impenetrable mass a large number of wallabies were seen, whilst in the scrub birds were fairly numerous. At the foot of Mt. Hunter, amongst the large granite boulders, shrubs of the beautiful crimson-berried *Cyathodes acerosa* were found within a few yards of the incoming tide. Proceeding hence along the beach the usual coast plants were found, among which was a very dwarfed form of the eucalypt, *E. viminalis*. On the beach the Sea Bindweed, *Calystegia Soldanella*, was found growing in the sand, exposed to the salt water; also *Caustis pentandra*, with stems 2 feet high, growing sparingly among the open scrub in company with *Schœnus nitens*, var. *major*, A. J. E., a new variety. Numbers of the Sulphur-crested Cockatoos were noted on this beach.

One of the most interesting gullies visited was at the head of Chinaman's Creek. Here *Eugenia Smithii* is very plentiful and of great size, as also are *Eucalyptus globulus*, *E. Muelleriana*, *E. goniocalyx*, and *Acacia melanoxylon*. The usual plants found in fern gullies were met with, including the rare fern, *Lindsaya trichomanoides*, which was not previously recorded for Victoria. This gully was the last we visited during the trip.

By tracing on the map the route travelled it will be seen that there is not much country left uninvestigated; however, our experience shows that many interesting plants may yet be found to add to the already published lists.

REPORT BY DR. SUTTON.

Privileged to accompany Messrs. Audas and St. John in their second visit to Wilson's Promontory, for the further botanical survey of the National Park, I am given the opportunity, by the courtesy of Dr. Ewart, to briefly supplement their reports on the expedition.

Unfortunately, time did not permit the completion of the survey on this occasion, but a third visit of similar length will probably suffice to examine the country to the east of the Central Range, from Mount Vereker to Mount Ramsay, the north-east

corner of the Promontory, and the very rough area between Mount Wilson and Refuge Cove, which still remain to be done. To the latter place it is to be hoped that before the next visit a track will be cut, as it is at present almost inaccessible.

As evidence of the thoroughness of the work of the first expedition, I would like to say that on a visit to the lighthouse from the Tidal River I did not note a single species not already collected by Messrs. Audas and St. John.

In regard to the plants noted on the visit, it may be said that the only real surprise was the finding of the *Lindsaya* (not already recorded from this State), and that many species which might reasonably have been expected to occur were not seen.

In reviewing the list of plants already recorded, we cannot but be struck by the absence in particular of *Helipterums*, of all *Goodenias* except *G. ovata*, of the *Prostantheras* except *P. lasiantha*, of the *Eriostemons* except *E. myoporoides*, of *Kennedyia monophylla*, *Vittadinia australis*, *Frankenia levis*, among others, and by the comparative rarity of *Crucifers*, *Pul-tenæas*, *Acacias*, *Eucalypts*, and *Brachycomes*.

It has been rumoured that it is the intention of the Forests Department to plant a large area at Barry's Creek with alien trees, and we may be permitted to hope that the rumour is without foundation. It has been generally understood that the plantation was to be kept strictly for the preservation of native plants and animals, and if any experimental planting is to be done, surely only our Australian trees should be tried.*

Finally, it might be as well to mention, for the benefit of those intending to visit the reservation, that if it is desired to avoid the long drive from Fish Creek to the Darby River, the Promontory can be very conveniently reached by way of Bennison to Bowen, a little fishing village on the Franklin River. From here Corner Inlet is crossed by one of the many fishing boats available, all of which are provided with motors; and the voyage is made, under favourable circumstances, in about two and a half hours, the visitor being put ashore near the northern end of the Vereker Range, only about five miles from the Darby River.

* [The agreement between the Forests Department and the National Park Committee includes a provision to this effect. The area set aside as a forest reserve for exotic trees is trifling as compared with the total area of the Park. The Committee anticipates receiving considerable assistance from the Forests Department in carrying out its objects.—A. J. E.]

MINERAL MAP OF VICTORIA.—In addition to the geological map of Victoria mentioned in the last *Naturalist*, the same map has been printed in paler colours, with the principal localities of thirty-seven varieties of minerals, &c., added, making it an extremely useful publication.

DESCRIPTION OF A NEW GENUS AND SPECIES OF
HONEY-EATER FROM WESTERN AUSTRALIA.

BY ALFRED J. NORTH, C.M.Z.S., Ornithologist to the
Australian Museum, Sydney.*

(Read before the Field Naturalists' Club of Victoria, 13th Dec., 1909.)

MENTION has been previously made, in the September number of this publication, of a small collection of birds sent by Mr. Henry L. White, of Belltrees, Scone, New South Wales, to the Curator of the Australian Museum, Sydney, for determination, and from which I there described a new species under the name of *Acanthiza whitlocki*. Among this collection, formed by Mr. F. L. Whitlock at Lake Way, in the East Murchison District, Western Australia, was a single skin labelled "*Pseudogerygone* ———, ad. male, Lake Way, East Murchison District, 19/7/09. F.L.W." The shape of the bill, the absence of rictal bristles, and general form, however, denoted at once that it was a Honey-eater. From its dull-coloured plumage I thought it possibly may have been an adult female of some unknown species, and therefore applied for more specimens. These Mr. White has recently received from Mr. Whitlock, and forwarded them on to the Curator. They consist of two more adult males, an adult female, and a nestling, obtained in the same locality. Mr. Whitlock was also fortunate enough to obtain its nest and eggs.

LACUSTROICA, *gen. nov.*

Exposed portion of bill slightly less than half the length of head, moderately straight, equal in height to breadth at nostril, the culmen distinctly arched, and decurved towards the tip; tongue grooved above, bifid at the tip. First primary short, the second equal in length to the seventh, the almost square end of the wing formed by the third, fourth, fifth, and sixth primaries, which are almost equal in length. Tail about two-thirds of the length of wing. Tarsi long, slender, about twice the length of bill.

LACUSTROICA WHITEI, *sp. nov.*

Adult Male.—General colour above ashy or dull greyish-brown; quills dusky brown, the outer webs of the innermost secondaries like the back, those of the outer series margined around the apical portion with whitey-brown or ashy-white; remainder of the quills less distinctly edged on their outer webs with ashy-white; upper tail coverts like the back; tail dark brown, the central feathers indistinctly margined around their tips with dull brownish-white, the remainder with a white spot at the tip of the inner web, larger on the outermost feather on either side, which is of a paler brown and has the outer web very narrowly edged with whitey-brown; lores, forehead, crown and sides of the head, ear coverts, and sides of the neck ashy dull greyish-brown, chin and

* Contributions from the Australian Museum, by permission of the Trustees.

centre of the upper throat dull white ; lower throat and foreneck pale greyish-brown ; remainder of the under surface and under tail coverts white, very faintly tinged with pale creamy-brown, and which extends on to the feathers of the foreneck in some specimens. "Bill dark horn colour, the base of lower mandible pale ; legs and feet lead-grey ; iris dull earthy-brown" (Whitlock). Total length (of skin), 4 inches ; wing 2.4, tail 1.75, bill 0.35, tarsus 0.6.

Adult Female.—Similar in plumage to the male.

Nestling.—Resembles the adult in plumage, but has a narrow ring of small whitish feathers around the eye, tinged with yellowish-green, the latter colour also extending on to feathers of the sides of the head, chin, throat, foreneck, and the outer webs of most of the quills. Total length (of skin), 3 inches ; wing 1.95, tail 1.

Habitat.—Lake Way, East Murchison District, Western Australia.

Remarks.—The genus *Lacustroica* is allied to *Entomophila*, and to that section of it which includes *E. picta*, but differs from it principally in having a shorter bill, longer tarsi, and a different wing-formula. In its dull colours it more closely approaches *E. albigularis* and *E. ruficularis*. *Lacustroica inconspicua* would fittingly designate this modestly plumaged little Honey-eater inhabiting the vicinity of Lake Way, but in response to a request from the owner of the specimens, who has done so much recently to advance Australian ornithology, I have associated with it the name of his son, Mr. Alfred Henry Ebsworth White, who, although yet young in years, I am informed is worthily following in his father's footsteps. Although generically allied to *Entomophila*, White's Honey-eater is an entirely new and distinct species, having no near ally, and may easily be distinguished from any other member of the family Meliphagidæ inhabiting Australia.

BOOKS, &c.

THE NATURALISED FLORA OF SOUTH AUSTRALIA. By J. M. Black, Adelaide. 5s.

The author of this handy work of 192 pages has laid botanical students and others under a debt of gratitude to him for the great amount of information he has compressed into his little volume. Commencing with a glossary of botanical terms, a few hints are given as to drying specimens, also some simple points to remember in pronouncing the Latin names of plants. Half a dozen pages are devoted to a key to the families, then the naturalised plants are dealt with. Of these 368 species are described, illustrated in the text with 206 drawings by the author ; these, though on a small scale, are very clear, and quite sufficient for identification purposes. A brief diagnosis of the genus, with in many cases the derivation of its name, is given, then

follows a more detailed description of the species, giving authority, common name, usual habitat, flowering time, and place of origin, thus forming a very complete handbook, which is well indexed, and will be found useful in other States than South Australia.

BUILDING AND ORNAMENTAL STONES OF NEW SOUTH WALES.

By R. T. Baker, F.L.S.

There has recently been issued by the Technological Museum, Sydney, a beautiful handbook of the building and ornamental stones of New South Wales, of which the State may well be proud. The principal feature of the work is the thirty-six coloured illustrations of granites, marbles, &c., executed in natural size and colours. Some of these are exquisitely pretty, and all are splendid examples of the printer's art. In addition to the illustrations of the stones, a large series of illustrations is given of buildings carried out in the various materials, which testify to the richness of New South Wales in building stones. Queen's Statue, Melbourne, is given as one of the examples of Caloola (Bathurst) marble. The volume is another example of the fine work turned out at the Government Printing Office, Sydney.

A BUSH CALENDAR. By Amy E. Mack (Mrs. L. Harrison).

With 42 illustrations from nature. Sydney: Angus and Robertson. 3s. 6d.

The publishers of this dainty little volume are to be congratulated on having placed within reach of all nature-lovers a series of articles which appeared originally in the columns of the *Sydney Morning Herald*. The book is not only delightfully written and illustrated, but there is more Australian natural history lore contained in its pages than in any volume of a similar character yet issued. Month by month the prominent birds and flowers are so charmingly dealt with that one regrets there are only twelve months in the year. Further essays from the talented authoress will be eagerly watched for, and though to Victorians some of the birds and plants may be unfamiliar, still it is easy to see with her in her rambles through the bush. For kindred spirits in the old country "A Bush Calendar" would be an excellent introduction to the sights and sounds of our bush.

TOURIST MAP OF MOUNT DANDENONG AND DISTRICT.—The Lands Department has issued a brief description, with a handy map of the Dandenong Ranges, on the scale of one inch to one mile, which includes the area from Ringwood to Lilydale and Emerald. An inset diagram indicates the views obtainable from the Trig. Station on Mt. Dandenong. A similar diagram for the look-out on One Tree Hill (together with its height, ? 1,495 feet) would have been a useful addition. It may be noted that Graham Falls and Sherbrooke Falls are synonymous. Copies may be obtained on asking at the Government Tourist Bureau, Collins-street.

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FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 17th January, 1910.

The president, Prof. A. J. Ewart, D.Sc., occupied the chair, and about 50 members and visitors were present.

Mr. A. J. North, C.M.Z.S., Sydney, wrote wishing the members the compliments of the season and the Club continued prosperity.

The hon. secretary stated that the dredging excursion announced for Saturday, 15th January, had not taken place, owing to the inability to procure a suitable boat.

The Chairman took the opportunity of welcoming Mr. J. Shephard on his return from a visit to England. Mr. Shephard, who was very cordially received, briefly referred to a visit paid to Selborne, the scene of Gilbert White's natural history writings, and to parts of Yorkshire which possessed great antiquarian interest.

ELECTION OF MEMBERS.

On a ballot being taken, Dr. Edward Ryan, Collins-street, Melbourne; Dr. Thos. F. Ryan, Nhill; and Mr. J. Twyford, 9 Villiers-street, Elsternwick, were duly elected members of the Club.

PAPERS READ.

1. By Messrs. J. G. O'Donoghue and P. R. H. St. John, entitled "Through the Brisbane Range."

The authors gave an account of the birds and plants met with during a three days' ramble from Bacchus Marsh to the Brisbane Range, about 15 miles south of that town, during the early part of last October.

The chairman and Mr. A. D. Hardy, F.L.S., congratulated the authors on the interesting nature of their description.

2. By Mr. F. Pitcher, entitled "The Victorian Vegetation in the Melbourne Botanic Gardens."

The author referred to the examples of the indigenous vegetation still remaining in the gardens, and to the efforts which had been made to cultivate a representative selection of Victorian plants. He also gave some selections of Victorian shrubs, &c., suitable for cultivation in small gardens. A catalogue of the Victorian plants now growing in the gardens, numbering about 400 species, was handed in for publication.

Mr. A. D. Hardy, F.L.S., referred to the cultivation of Victorian trees, &c., in small gardens, and related his experiences with

some of the well-known shrubs from the more elevated parts of the State.

The Chairman said that while it was very desirable to have a series of Victorian plants in cultivation close to the city for the benefit of visitors and students, he preferred to see an area set aside, such as the National Park, where the plants could be seen in their natural associations.

3. By Mr. A. J. North, C.M.Z.S., entitled "Notes on the Nest and Eggs of *Amytis macrurus*, Gould."

[Owing to the lateness of the hour, this paper was taken as read.]

The author stated that he had recently received for description three sets of the eggs of the Large-tailed Grass-Wren, *Amytis macrurus*, Gld., obtained by Mr. C. G. Gibson, near Kalgoorlie, Western Australia. The bird is a rare one, and its nest had not hitherto been figured.

NATURAL HISTORY NOTES.

Mr. R. W. Armitage called attention to his exhibit of a piece of basalt from the Clifton Hill quarry, enclosing a piece of charred wood, which was thus strictly a fossil in an igneous rock.

Mr. E. B. Nicholls called attention to the photographs exhibited of the nest of a Podargus, taken at Black Rock.

Mr. J. Stickland mentioned that when at Warburton recently he measured a frond of *Lomaria discolor* 5 feet 9 inches in length.

EXHIBITS.

By Mr. R. W. Armitage.—A piece of basalt enclosing a piece of charred wood, from Clifton Hill quarry.

By Mr. F. G. A. Barnard.—Pot-grown specimen of *Lomaria Patersoni*, from Falls Creek, Upper Yarra.

By Mr. A. D. Hardy, F.L.S.—Abnormal fronds of *Lomaria discolor*.

By Mr. G. A. Keatland.—Specimen of the Brush-tailed Phascogale, *Phascogale penicillata*, from Seymour.

By Mr. A. J. North, C.M.Z.S.—Photograph of nest and eggs of *Amytis macrurus*, in illustration of paper.

By Mr. J. G. O'Donoghue.—Fossiliferous limestone from Moorabool Valley, between Maude and Lethbridge; Rhylite, from Mount Lofty, South Australia.

By Mr. F. Pitcher.—"Boee Wan," or Native Bread fungus, *Mytilitta australis*, found at Warburton, Christmas, 1909; photographs of scenes in the Melbourne Botanic Gardens, also flowers of *Prostanthera lasiantha*, *Bauera rubioides*, *Banksia serrata*, *Tristania laurina*, and *Bursaria Pantoni*, grown in Botanic Gardens, in illustration of paper.

By Mr. C. L. Plumridge.—Pot-grown specimen of fern, *Lomaria discolor*, var. *bipinnatifida*.

By Mr. F. Spry.—Australian ants belonging to genus *Podomyrma*; rare beetles from Western Australia—*Megacephala blackburni*, Fleutiaux, *M. castelnau*, Sloane, and *Cunipectus frenchi*, Slne.; rare butterfly, *Dodonidia helmsi*, Fereday, from New Zealand.

By Mr. P. R. H. St. John.—Plant of fern *Lindsaya trichomanoides* from Wilson's Promontory, recently recorded as new for Victoria.

After the usual conversazione the meeting terminated.

THE LATE REV. J. J. HALLEY.—It is with great regret we record the sudden death of the Rev. J. J. Halley, who was one of the first vice-presidents of the Field Naturalists' Club of Victoria (1880-3), and for three years (1884-7) its president. Mr. Halley's presidential addresses were greatly enjoyed by those privileged to hear them, and general regret was expressed when the increase of his denominational duties necessitated him setting aside his love for natural science.

WE are pleased to record that Mr. O. A. Sayce, Demonstrator in Bacteriology in the University of Melbourne, has been awarded an Associateship by the Linnean Society of London, in recognition of his valuable research work.

"A Quarter-Century of Technical Education in New South Wales" is the title of a quarto volume of 320 pages recently issued by the Education Department of that State on the occasion of the exhibition of students' work held at the Sydney Technical College, Easter week, 1909. A brief introduction is given by the Minister of Education, Hon. J. A. Hogue; then the Superintendent of Technical Education, Mr. J. W. Turner, in an article of 142 pages, entitled "Technical Education," gives a general view of the subject as dealt with in other countries, what has been achieved in the twenty-five years in New South Wales, the present condition and its future in New South Wales. Statistics for 1908 show 18,490 students, paying fees of £14,176. Botany, zoology, and geology are included in the lecture courses. In his optimistic remarks on the future he is so carried away by the wonderful advantages he sees in the position, &c., of Sydney as "the London, New York, Glasgow, Athens, and Rome of the southern hemisphere," that he quite overlooks the fact that other great and prosperous cities exist in South America, in South Africa, and even in Australia. The volume concludes with a detailed description of the various departments of the Sydney Technical College and its adjuncts, which is very fully illustrated with a fine series of plates, and shows it to be well up to date. The volume is a highly creditable production, and was printed at the Government Printing Office, Sydney.

EXCURSION TO TOOLANGI.

FINE weather favoured those members who took part in the first Club excursion to Toolangi. Five members greeted the leader on the Yarra Glen platform at 10.15 a.m. on Saturday, 13th November. Here we found a waggonette and pair waiting to take us to our destination up in the ranges some 14 miles away. The road for the first six miles was fairly level, but very dusty, and kept in the valley of Dixon's Creek. Then turning to the right, the creek was crossed. In about a mile we turned to the north once more, and began to ascend a ridge which separates Dixon's Creek valley from that of View Hill Creek. We quickly rose above the surrounding valleys, and at about $8\frac{1}{2}$ miles rounded "Cape Horn," as it is locally styled. From this vantage point, about 850 feet above sea-level, a magnificent expanse of tree-covered hillsides presented itself, especially of the ridge separating View Hill Creek from the Chum Creek. As we gradually ascended a few wild flowers appeared along the roadsides, such as *Billardiera*, *Comesperma*, *Veronica*, *Goodenia*, &c. We were now in interesting country from a physiographical point of view, for far down below us on our left was the broad valley occupied by Dixon's and Steel's Creeks, which Professor Gregory in his "Geography of Victoria," terms the "old valley of the middle Yarra," and were approaching that part of the Dividing Range which he styles the "Kingleake Gap," which is only about 1,250 feet, above sea-level. At about $12\frac{1}{2}$ miles we reached the main divide, and turned eastwards towards Toolangi, still about a mile and a half distant. Here the trees were much larger; huge specimens of the mountain ash, *Eucalyptus amygdalina*, up to 250 feet, were frequent, while in places a dense growth of smaller trees, say 6 inches through and 50 to 60 feet high, prevailed. A little colour was given to the scene by the wealth of the clear yellow flowers of *Goodenia ovata*, which all through the outing was exceptionally fine. *Eutaxia empetrifolia* and *Pultenaea Gunnii* added other shades, while smaller plants, such as *Candollea serrulata* and *Wahlenbergia gracilis* were conspicuous by their pink and blue flowers among the wayside vegetation. Here we were about 1,600 feet above sea-level, the road continuing along the crest of the divide. On our left were some selections sloping down to the Muddy Creek, or Yea River, and presently a turning led to the little township of Toolangi, consisting of the State school and a few houses, the inhabitants of which depend principally on the timber industry for their means of support. The track wound through the forest, and presently, in a slight hollow, Toolangi House came into view, backed up by the high cone of Mt. St. Leonard (3,304 feet), a few miles further on. Before going inside it was necessary to get rid of some of the dust gathered on the way up, and we found bracken fern a very useful means, and it was quickly taken advantage of. Toolangi House

proved to be a very comfortably arranged and commodious dwelling, and by evening some 40 visitors had gathered under its roof. Its position is unique, for the divide runs right through the house, so that rain falling on the front verandah drains to the Yea River, thence to the Goulburn and the Murray, while the back part of the house sends its rainfall to the Chum Creek, the Watts, and the Yarra. The name Toolangi, according to Mr. Saxton, in his interesting little work, "Victoria: Place-Names and their Origin," is the native word for zeal, enthusiasm, eagerness, but I was told up there that it meant "plenty." If the latter be the case, the question arises, plenty of what, for hills, trees, streams, and birds are in plenty everywhere. Mr. Saxton has given me the height of Toolangi House as 1,500 feet from barometrical observations he made some time ago, but it is hard to believe that Mt. St. Leonard is 1,800 feet higher, and I should like to add at least a couple of hundred feet to the height of Toolangi House.

After lunch the question arose as to how to fill in the afternoon, and as there was a possibility of joining a photographic party on the morrow who intended visiting a myrtle gully some 7 miles away, we decided to try and find the Sylvia Falls, one of the beauty spots of the locality, which are some $2\frac{1}{2}$ miles away in a north-easterly direction, being situated on a creek rising on a northerly spur of St. Leonard. The Yea River comes within about 400 yards of the house, and at this point makes its nearest approach to the divide, and as at the same time it cannot be more than 200 feet lower, to divert its waters into the Yarra basin would not be a difficult engineering feat. Our route led down to the stream, embowered in a wealth of stately Silver Wattles, *Acacia dealbata*, with hazel, musk, lomatia, panax, and other shrubs. We had hardly crossed the stream, some 15 feet wide, on a footbridge of two springy saplings, when one of the party called attention to a lilac-flowering shrub not far from the road, which in the distance seemed to be surrounded by a blue haze. Quickly making for it, we were all delighted with its charming appearance when viewed at closer range. It proved to be one of the mint-bushes, *Prostanthera melissifolia*, and surely may be regarded as one of the gems of the Victorian bush. Needless to say the tree suffered to some extent in being robbed of some of its flowering branches. Continuing on, our road gradually ascended, leaving the river in dense scrub down below on our right. The scrub was very thick on either hand, and in it numerous birds were to be heard, and occasionally seen; among them was the Rufous Fantail. Coming to a part which had been cleared, but where there were numerous tree-fern stems still standing, it was interesting to note that many of them were acting as hosts for other plants. Perhaps the most frequent parasite was *Pittosporum bicolor*, often called "Cheesewood."

We soon came to big timber again, and on one of the trees was a notice—"Sylvia Falls, 1 mile," but the track, which had suffered from a recent fire, and also owing to the operations of timber-getters, was hard to find. However, we determined to work down to the stream, and found a wealth of mountain vegetation, such as the Native Pepper, *Drimys aromatica*, the Native Mulberry, *Hedycarya Cunninghami*, the Sassafras, *Atherosperma moschatum*, the Musk, *Aster argophyllus*, and the Beech, *Fagus Cunninghami*. Of the latter we were able to secure a number of seedlings, and a package of about thirty was sent to the Botanic Gardens on our return to town. Here also grew the ferns *Lomaria fluviatilis*, *Polypodium Australe*, &c., with very fine examples of the giant moss, *Dawsonia superba*. The orchid, *Chiloglottis Gunnii* was noted on the tree-fern stems, and the miniature Irid, *Sisyrinchium pulchellum*. Working up stream a little we came to signs of a camping ground, and found we had reached the Sylvia Creek junction, but, owing to the position of a large fallen tree, it appeared as if the creek were the main stream. We turned up the creek, which came in from the east, and soon came to a cascade some 12 or 15 feet high, with several smaller ones higher up. Presently, as the track seemed to stop, we returned the way we had come, but I have since learned that we did not reach the most imposing fall, which occurs in the dacite country towards the head of the creek; the cascades we saw were occasioned by ledges of silurian rock. A little exploration about the junction revealed a magnificent growth of the Umbrella Fern, *Gleichenia flabellata*, many of the fronds being at least two feet across. As it was getting late, we turned homewards, and on arrival found that another member, Mr. R. Kelly, and one of his boys had walked up from Healesville, *viâ* the Chum Creek, some 12 miles. After tea three of the party found their way by devious tracks to the State school, where a lantern lecture illustrating a trip to New Zealand was given by one of the visitors at the house. This proved very interesting, but the trouble was to get home again, as there was no moon, and the bush thereabouts is full of tracks. However, by the expenditure of the greater part of a box of matches, they eventually reached the house safely, but certainly by a different track from that which they had followed on the outward journey.

Sunday morning broke delightfully fine, and a stroll before breakfast was indulged in. For this we selected another track, which led up the valley, along the water-race which provides the domestic supply. Coachwhip-birds made the bush resound with their whip-like notes, while many other birds flitted about in the scrub. Some huge trees were again passed, and a few more bushes of the *Prostanthera* seen, and some young plants obtained. Along the race seedling ferns of various kinds were in plenty, and

some were removed for home cultivation. A number of mosses were also secured, but insects were very scarce. After breakfast, as Mr. Kelly reported that *Leptospermum scoparium* was blooming well in the lower country, we determined to try in that direction and see if any beetles were to be caught, but we spent too much time on top of the range stripping bark and turning logs, with poor results owing to the dry weather. Then we turned down into a hollow which afterwards became a fern-gully, the head of the western branch of Chum Creek. Here among the tree-ferns grew some fine specimens of *Asplenium umbrosum*, but the descent was too rough, so we worked out on to the hillside, but little of interest was noted before we returned to lunch. Insects were extremely scarce, though a number of Painted Lady butterflies, *Pyrameis Kershawi*, were flying about the brilliant yellow blossoms of a fine growth of *Senecio dryadens*.

In the afternoon another attempt was made on the Chum Creek valley, and with better success. Taking a spur forming the western boundary of the eastern branch, we soon got into a portion of the Victoria State Forest, and presently the whole hillside was a perfect flower garden. The deep orange flowers of *Pultenaea Gunnii* were chiefly responsible for the gay scene, but *Grevillea alpina* (scarlet), *Eriostemon corneifolius* (lemon), *Tetralthea ciliata* (pink), *Comespermum volubile* (pink), and *Goodenia ovata* (yellow) added other tints to the wayside. Various acacias and *Epacris impressa* had been very fine earlier in the season, but were now quite over. Crossing the creek, we came to some poor heathy land with stunted gums, not far from where *Grevillea repens* was noted on the Healesville excursion in January last. Here *Dillwynia floribunda* (bright brick-red) was the most prominent flower, with occasionally *Grevillea repens* and *Bæckeia diffusa*. The pure white blossoms of *Leptospermum scoparium* were plentiful, but beetles were conspicuous by their absence. Further on some clumps of the splendid blue *Dianella revoluta* (Liliaceæ) added another colour to the scene. A solitary specimen of the blue orchid, *Thelymitra aristata*, was observed. Numbers of the flower-spikes of the smaller grass-tree, *Xanthorrhæa australis*, were to be seen. Several bushes of *Banksia collina* were noted, but the flowers were over. It was getting late, and as we had a climb of about a thousand feet to accomplish in a distance of about three miles, we turned homeward, taking the track up the western branch of the creek, which eventually led us to the part we had traversed in the morning. Great patches of the fern *Blechnum cartilagineum* and the Golden Bracken, *Davallia dubia*, were passed, and again *Goodenia ovata*, though such a ubiquitous plant, called for special admiration. Growing on a fence, as we returned, was a splendid plant of *Clematis aristata* in full bloom, the pleasant perfume of which was distinctly noticeable many yards away.

During the early morning a slight shower occurred, but it had no other effect than to slightly wet the grass. Another early morning stroll, this time towards the township, showed a fine growth of the Christmas-tree, *Prostanthera lasiantha*, at a ford over the river, and a pretty sight close by was afforded by a fine growth of *Aster stellulatus* in full bloom; in fact, it reminded one of a snow scene in a pantomime, while here and there the pale lilac flowers of *Prostanthera melissifolia* added colour to the scene. Rambling home by the road along the river revealed a wealth of vegetation. After breakfast we decided to visit the "Canoe." The canoe is the burned-out trunk of a large tree which forms a bridge across the stream, and reminds one of a blackfellow's canoe. It is situated amidst tree-ferns, *Panax*, *Zieria*, *Hedycarya*, &c., and the locality proved a good collecting ground for mosses, &c. A fine beech was growing on the edge of the stream, but we could not find any more seedlings. A shrub here puzzled us for a time, but we eventually decided it was only a form of *Panax sambucifolius*. *Zieria Smithii* was in bloom in many places. The Coral Fern, *Gleichenia circinata* was growing up some tea-tree to the height of 15 feet or more, while all around was a dense growth of *Lomaria capensis*, var. *procera*, its red fronds forming a very distinctive feature. A pretty group of tree-ferns was easily visible from the road. Being so near the house, the reserves along the Yea River should for many years prove handy collecting-grounds for cryptogamic and other plants. Returning to the house, we began to pack our belongings, and after lunch five of us started off on the walk to Healesville *via* Myers Creek, some 10 or 12 miles. For about two miles we went easterly along the divide towards Mt. St. Leonard, when at the site of an old sawmill we turned southwards along a track through dense scrub, almost blocked in places by the shrubs broken down by the winter snowfall. Here again we passed a beautiful bush of *Prostanthera melissifolia*. In about three miles we struck the old tram line, and thenceforward there was no doubt about our route, for the tram can be followed all the way to Healesville. The head of Myers Creek was soon reached, and then our road was all down hill. The upper part of the valley had suffered severely from fires during recent years, and we began to fear that the interest of our afternoon's walk would have been spoiled. At a soakage across the track a fine group of King Ferns, *Osmunda barbara*, were just recovering from their scorch, and some small specimens were removed for home cultivation. As usual in moist burnt places there was a fine growth of *Marchantia polymorpha*, and along with it *Polypodium punctatum*, another plant which shows a liking for such situations. As we descended the scenery improved, and we were soon admiring hillsides with as fine a variety of foliage as one could wish to see. A homestead embowered in a group of fine *Acacia*

penninervis was seen on our right. The Silver Wattles in the valley were very fine, while very tall eucalypts were plentiful. Presently an old mill site was passed. The creepers *Lyonsia*, *Clematis*, and *Tecoma* were seen twining about the shrubs. *Pimelea ligustrina*, *Grevillea alpina*, *Eriostemon correatifolius*, *Pultenaea Gunnii*, and other shrubs were noted. At about half-way a halt was made for a few minutes at the Meyers Falls, and the scene admired. In another mile or so the higher hills came to an end, and the creek found its way through flatter country to join the Watts or Maroondah near the end of the St. Leonard's road, about $1\frac{1}{2}$ miles from Healesville. The creek runs through country interesting geologically, for here (see "Records of Geological Survey of Victoria," vol. ii., part 4, page 199) we were on the junction of the great Mt. Juliet dacite area with the silurian, in which one or two isolated granite outcrops occur close to the creek. We passed a fine lot of *Leptospermum scoparium* in full bloom, but it was now too late in the day for beetles. It was strange that insects were so scarce all through the trip, as we were in country which should have yielded many varieties. Healesville was reached about 6.30 p.m. Here we found a great throng of holiday-makers, and we had to let two special trains go before we could get a seat. However, town was reached in the companionship of some friends who had been exploring the new track recently cut round Mt. Juliet by the Board of Works, so the time passed pleasantly.

I am indebted to Mr. E. B. Nicholls for the following notes about the bird-life of the outing. He says:—"During the trip thirty-eight species of birds were recognized, including the Gang Gang Cockatoo, of which a fair number were seen, also the King Lory. Traces of the Black Cockatoo and Lyre-bird were also met with in some of the gullies. A Red Lory, *Platycercus elegans*, was found feeding upon the galls attached to the leaves of young eucalypts. The rather rare Rufous Fantail was seen in a patch of tall bracken fern some distance from water. The Grey Crow-Shrike (Grey Magpie), Coachwhip-bird, and Sordid Wood-Swallow were seen, and also the White-fronted Chat, a bird of the coast and plains. The commonest bird notes were those of the Fantailed Cuckoo, Crescent Honey-eater, and White-throated Thick-head. The song of the last-mentioned species at this time of year is particularly good, and the birds themselves, in their rich black and yellow plumage, rival in their gay appearance even the red-breasted robins."

The following notes on the Coleoptera, &c., have been handed to me by Mr. J. A. Kershaw, F.E.S., of the National Museum. He says:—"Insects were as a rule scarce, probably due to the unfavourable climatic conditions. Of Lepidoptera only common species were seen, and these were not numerous. Ants, however, were fairly plentiful. Among Coleoptera may be mentioned

Notonomus besti, Sloane, and *N. peronii*, Castel. (Carabidæ), common under logs; *Lissotus howittii* (Lucanidæ)—good specimens were taken under logs in gullies; a Staphylinid, *Oxytelus*, sp., was very numerous in Wombat dung, and is new to the Museum collection; a rare Tenebrionid, *Lepispilus*, sp., was also taken. Other captures were *Tyrus*, sp. (Pselaphidæ), *Lissapterus howittianus*, Westw. (Lucanidæ), *Aphodius victoriæ*, Blackb. (Scarabæidæ), *Coripera ocellata*, Pasc., *Seirotana*, sp. (Tenebrionidæ), and *Centyres sinuatus*, Blackb. (Curculionidæ). Among land shells several fine living examples of the Black Snail, *Paryphanta atramentaria*, were obtained in the gullies, as well as a species of Endodonta and a small Helix. Land planarians were by no means common, still five or six species were taken, among them being *Geoplana spenceri*, *G. mediolineata*, and *G. munda*. Of lizards five species were noted, *Hinulia quoyi* being the most numerous. The only snake seen was a Copperhead, *Denisonia superba*, which had effectually done for itself by inserting its head into a hole in a tin kettle, presumably after a lizard, and had then been unable to withdraw from the awkward position."

To Mr. Reginald Kelly I am indebted for a list of the mosses, &c., worked out by Mr. J. R. Murdoch, of Mortlake.

MOSSES.

Dicranum Menziesii	Meteorium limbatum
" Billardieri	Hookeria nigella
Leucobryum candidum	Leptostomum inclinans
Polytrichum piliferum	Hypnum cupressiforme
Funaria hygrometrica	" " var.
Bartramia affinis	" " var.
Macromitrium pusillum	" extenuatum
Hypnodendron arcuatum	Ptychomnion aciculare
" comosum	Cemyplopus introflexus
Thuidium suberectum	Bryum—several

HEPATICS.

Podomitrium phyllanthus	Plagiochila deltoidea
Metzgeria furcata	Chiloscyphus coalitus
Lepidozia pendulina	Gymnantha deplophylla
Polyotus magellanica	Symphogyna flabellata
Plagiochila strombifolia	

The excursion to Toolangi, if not productive of many unique specimens, was, at any rate, enjoyable and full of interest, and might be repeated at no distant date. For those who wish to see big trees the locality can be highly recommended, but to naturalists it was sad to see the destruction of forest giants going on in every direction. Further, a visit to Myers Falls would make a suitable one-day outing in the spring if arrangements were made to be driven from and to Healesville (six miles each way), and I think would reveal a luxuriance and variety of vegetation which would be a surprise to many members of our Club.—F. G. A. BARNARD.

THROUGH THE BRISBANE RANGE.

BY J. G. O'DONOGHUE AND P. R. H. ST. JOHN.

(Read before the Field Naturalists' Club of Victoria, 17th Jan., 1910.)

IN daytime, as the train traverses the broad expanse of treeless plain between Melbourne and Bacchus Marsh, the traveller is afforded, at many points, a distant glimpse, away to the south-west, of the long, low, undulating bulk of the Brisbane Range. A much nearer view is obtained as the labouring engines, in negotiating the steep gradient leading from Bacchus Marsh to the basaltic table-land separating the Werribee and Parwan valleys, cross the high pile-bridge near the Rowsley State school. Transient though the view may be, it suffices to demonstrate that the range rises abruptly from a level plain, and that it presents a somewhat monotonous contour. Situated almost in the middle of the triangle formed by Melbourne, Geelong, and Ballarat, and though fairly accessible, the Brisbane Range is unknown even by name to the majority of people. Some folk can claim a nodding acquaintance with it, and others a more familiar knowledge. Margined by large estates, particularly on the seaward slopes, consisting for the greater part of inferior pastoral country, presenting no physical features calculated to excite the curiosity of the sight-seer, and not being in the line of direct communication between townships of any importance, the range is seldom traversed. Within the past four years I have crossed it on at least ten occasions, at various hours of the day and night, and once only was a wayfarer encountered.

From remarks made respecting the varied vegetation to be met with in this elevated tract of country, my fellow-member, Mr. P. R. H. St. John, expressed a desire to visit it on a botanizing expedition, so arrangements towards the realization of this aspiration were soon made, and, despite the Government Meteorologist's forecast of rain and high winds from the north-west, we left Melbourne by the 7.40 a.m. train for Bacchus Marsh on Friday, 1st October, on a tour of three days' duration.

The morning was an ideal one, and as the train steamed across the plain to our destination, the profusion of wild flowers in the railway reserve engendered an expectation of a generous harvest on the range, which at Deer Park showed up prominently to the south-west. Bacchus Marsh was reached at 9 a.m., and five minutes later, with burdened shoulders, we were shaping a course for the Rowsley pile-bridge.

Our route lay over land timbered with the Grey and Yellow Box—*Eucalyptus hemiphloia* and *E. melliodora*—with the She-oak, *Casuarina stricta*, and profusely carpeted with native and exotic plants by reason of one of the most favourable seasons known locally for years. Among other flowers noticed *Microseris Forsteri*, *Diuris maculata*, *Glossodia major*, *Hypoxis glabella*,

Wurmbea dioica, *Cymbanotus Lawsonianus*, *Brachycome ciliare*, *Ranunculus lappaceus*, *Leeuwenhoekia dubia*, *Erechtites arguta*, and *Craspedia Richea* were unusually abundant. Crossing the railway for the second time above the Rowsley station, we struck the Parwan Creek and journeyed along the left bank for some distance, noting on the way numbers of robust specimens of the introduced Cape Spurge-wort, *Euphorbia lathyris*, and a fine tree of the Twisted Acacia, *A. implexa*, in full bloom. Hereabouts numerous representatives of the feathered tribe had congregated, and were enlivening the woodland with their varied calls.

Directly in our course some fifty Sulphur-crested Cockatoos were observed feeding amongst a growth of Cape-weed, *Cryptostemma calendulaceum*. We succeeded in approaching within two chains before being detected by the birds, which took wing with loud screeches of alarm; the sentinel, who had evidently been asleep at his post in the Yellow Box tree under which we passed, making up for his neglect of duty by pronounced vociferousness. An inspection of the spot where the birds were foraging revealed the fact that they had been feeding on the bulb of the Victorian Crocus, *Hypoxis glabella*. Another, but smaller, flock met with at the foot of the Brisbane Range on the return journey on Sunday was also found to be levying heavy toll on that small yellow-flowered plant. The ground over which the birds had operated appeared as if it had been scarified.

The foothills were gained about 11 a.m., the prevailing timber on this portion of the basalt area being *Eucalyptus hemiphloia*, *E. melliodora*, *E. sideroxylon*, *E. polyanthemos*, *Casuarina stricta*, and *Acacia melanoxylon*. About noon a fine sheet of water known as the sheep-wash dam was reached. Here, as previously determined, a halt was made for lunch, and whilst the water in the billy was attaining boiling point we turned our attention to bird-life in the neighbourhood, and in a very small area noted the White-fronted Heron, Pied Cormorant, Spotted-sided Finch, White-throated and Brown Tree-creepers, Black-faced Graucalus, Pipit, Restless Flycatcher, Mistletoe-bird, and several species of honey-eaters. Whilst lunching, a Grebe paddled up from the embankment of the dam, against a stiff breeze and choppy water, to gaze inquiringly at us, but as a portion of one of the Melbourne daily papers, with suggestions therein to combat "our greatest peril," started on a frolic, the bird left for home very hurriedly, most of the way under water.

Our journey was resumed an hour later, and shortly after the limit of the basalt was reached, and the Silurian formation, with its distinctive vegetation, entered upon. A few chains sufficed to reveal a wealth of flowers and flowering shrubs. Orchids were particularly in evidence. The purple *Glossodia major* occurred in countless thousands, and, with *Pterostylis curta* and *P. nutans*, *Diuris maculata*, and the composite *Microseris Forsteri*, margined

the track and stretched far back into the recesses of the timber. With them abounded *Pultenaea daphnoides*, *Dillwynia cinerascens*, *Tetratheca ciliata*, *T. ericifolia*, *Hibbertia acicularis*, *H. stricta*, *Daviesia corymbosa*, *Veronica perfoliata*, *Aster* (*Olearia*) *pimeleoides*, *A. teretifolia*, *Styphelia humifusa*, and the white and pink varieties of the Native Heath, *Epacris impressa*; the rich golden yellow of *Acacia pycnantha* contrasting to advantage with the paler yellow of *A. acinacea* and *A. aspera*, these in turn with the *Tetratheca* and *Veronica* and the two species of the Native Daisy tree, the whole exhibiting a luxuriance of growth and flowering splendour that only a congenial spring can promote.

Selecting specimens of each of the flowers and flowering shrubs mentioned, we pushed on towards Beremboke, with increasing forebodings as to the continuity of fine weather. The domain of the Grass-tree, *Xanthorrhœa australis*, was next reached, and soon the slopes of the valleys on our right and left were thickly clad by numberless specimens of this uncouth growth. No inflorescence was observed, though a few plants had begun to develop their flower-spikes. Presently, in the midst of a tropical down-pour of rain, when our feelings were down to zero, the rare *Boronia polygalifolia*, var. *anemonifolia*, and *Prostanthera hirtula* were simultaneously discovered, and shortly after *Grevillea aquifolium* and the red-flowered variety of *Correa speciosa*. The parasitic *Cassytha melantha* was often noted, twining on the dwarf eucalypts and other shrubs. So far as our observation extended in the journey through the range, the various flowers and flowering shrubs existed in great abundance, while the Grey Box and the two iron-barked gums, *Eucalyptus sideroxylon* and *E. leucoxylon*, were flowering freely. To the banquet so lavishly spread by nature the honey-eaters had gathered in force. They were to be seen everywhere, and the welkin rang continuously with their varied calls.

Years ago the Mallee-Hen inhabited the recesses of the range, but was either exterminated by the settlers or retired to remoter localities as the environs of its habitat were selected.

About 4 p.m. the first glimpse of the mammaloid bulk of Mount Wallace was obtained. A few minutes later we crossed a shallow, grassy depression, that defined the boundary of the Silurian and Basaltic formations. This depression constituted the head of the Little River. The change was strikingly apparent. The Silurian, with its recurring hill and valley and its dense and varied vegetation, had suddenly ended, and had been succeeded by a level plain supporting isolated, gnarled specimens of the Blackwood, *Acacia melanoxylon*. The soil was fertile, and nourished a luxuriant growth of rye and the so-called Rib-grass, *Plantago lanceolata*, while struggling for existence against these two exotics were *Erodium cynorum* and *E. cicutarium*, *Claytonia Australasica*, *Hypoxis glabella*, *Wurmbea dioica*, *Ranunculus lappaceus*,

Microseris Forsteri, *Diuris pedunculata*, *Brachycome decipiens*, and other native plants. Journeying south for two miles further across the plain, we at length reached our destination—the residence of Mr. H. Cameron, where we were cordially welcomed. It had been our intention to journey to Steiglitz, about eight miles to the south-west, the following day, stay there that night, and make an early start on Sunday for Parwan, *viâ* Anakie and Staughton Vale, to enable us to catch the 7 p.m. train from Bacchus Marsh, while the magnitude of this task was to be further increased by our proposal to ascend one of the mammaloid points of eruption situated between the granite outcrop at Anakie and the You Yangs; but, yielding to the generous desire of our host, we decided to forego our purpose, and to make his residence the base of our investigations on the following day.

About half-past eight on Saturday morning, accompanied by Mr. Cameron, who is a keen observer of nature, we struck south, and, again crossing the sharply defined junction of the Basalt and Silurian formations, entered a dense forest of Messmate and Stringy-bark, *E. obliqua* and *E. macrorrhyncha*. Passing along an anticline, from whose eastern slope an affluent of the Little River starts, we were soon in interesting country. Here, as on the range further north the previous day, the honey-eaters were to be seen and heard on every side amid the blossom-bedecked foliage of *Eucalyptus polyanthemus*, *E. obliqua*, *E. sideroxylon*, and *E. macrorrhyncha*.

Following the Little River, which has eroded its channel across the basalt edge of the Silurian strata, we approached within a mile of the plains at Staughton Vale, collecting, among other specimens, *Myoporum viscosum*, *M. deserti*, *Bursaria spinosa*, *Leptospermum lanigerum*, *Caladenia carnea*, *Clematis microphylla*, and *Exocarpus cupressiformis*.

The strata hereabouts are vertical, the strike being, as is usually the case with the primary or Palæozoic formation in Victoria, north, or a little to the east or west of north. The anticlinal and synclinal undulations were sharp and numerous, and served to demonstrate the enormous plication to which these ancient sedimentary deposits had been subjected. Outcrops of quartz were often encountered, but no auriferous specimens rewarded repeated search. The trend of the gullies coincided with the strike of the strata, the eastern slope being invariably clothed with luxuriant grass and plants, whilst the western was noticeably barren, the cause being probably due to the sun's rays striking more directly and with greater power on the latter than on the former.

Quitting the river, we bore south-west through grass-tree country towards the Geelong Reservoir reserve. On entering the reserve *Grevillea floribunda* was found in abundance, and again the red variety of *Correa speciosa*. The contrast of the vegetation within the reserve and that on the adjacent land was very marked.

Here *Tetralthea ciliata* showed everywhere in large blotches of colour, as did the red and white *Epacris* and various acacias.

Returning to Mr. Cameron's about noon, after dinner we again set out in the direction of the reservoir, noting on the way a fine specimen of the Victorian Hemp-bush, *Plagianthus pulchellus*, in full bloom. On entering the reserve in the neighbourhood of several large swamps, the ground was found to be simply carpeted with *Tetralthea*. So dense and tall was the growth of this plant that it could have been mown in swathes, and when the mass of blossom billowed under the breeze the effect presented can be easier imagined than described. Nodding plumes of *Dillwynia cinerascens* were also in evidence, whilst in and along the margin of the swamps thousands of the large white flowers of the Australian Daisy, *Brachycome cardiocarpa* added their tribute of beauty to the scene. The contrast of mauve, green, yellow, and white was very attractive. Later in the spring, when the *Brachycome* has passed away, the Marsh Buttercup, *Limnanthemum exaltatum* (Gentianæ), will unfold its chrome-yellow flowers to the traveller's gaze.

Amid these delectable surroundings, with but a small mound and a rough weather-beaten slab to mark the spot, lies the mouldering remains of "somebody's darling," whose name even to the oldest inhabitant is a matter of speculation.

Following up the valley, down which the overflow from the reservoir runs, we found it invested with *Leptospermum lanigerum* and *Acacia verticillata*. *Pterostylis nutans* and *curta* were plentiful hereabouts, while *Indigofera australis* was occasionally met with. On reaching the reservoir, which is picturesquely situated, we found it filled to its utmost capacity, the gauge at the tower registering a depth of 57 feet.

As there were palpable indications of a "dirty" afternoon we did not deem it advisable to wander further afield. Bearing north-east we hastened homewards, discovering on the way the nests of the Brown Kingfisher, Crimson Lory, and the Scarlet-breasted Robin.

We were early astir on Sunday morning, and as the driving rain swept past our bedroom window we speculated on our condition if the weather failed to moderate ere the score of miles that separated us from the Parwan station were traversed. Shortly before 9 a.m. the weather cleared sufficiently for us to begin the "home stretch." Accompanied by our host, we struck due east across a clear and wind-swept basaltic plain, and, descending a steep slope, found ourselves in the shelter of the timber growing on the Silurian formation. Here, as on other parts of the range, the ravages of the larvæ of the Cup or Slug Moth, *Doratifera vulnerans*, on the foliage of the dwarf gums were very noticeable. About 10 o'clock we reluctantly bade adieu to Mr. Cameron, and hastened on, in the midst of driving

showers. The acacias along our route were greatly in evidence, and among them *A. aspera*, *A. myrtifolia*, *A. Mitchellii*, *A. oxycedrus*, *A. acinacea*, *A. tenuifolia*, and *A. armata* were noted. *Pultenaea daphnoides*, *Platylobium formosum*, *Styphelia virgata*, *S. glacialis*, and *Grevillea aquifolium* were also conspicuous amid the heath and grass-trees. About 11 o'clock we reached one of the highest points on the range, where years ago considerable effort had been expended in testing one or more auriferous lodes. The view hereabouts, seawards and to the north-east, on a clear day should be an extensive one.

Descending the northern slope of this point, we ascended the acclivity opposite, and, crossing a saddle, again descended into a small valley embouching on to the plain. In the final descent the uncommon *Phyllanthus thymoides* was gathered. The trend of the valley was east and west, and presented a series of charming views. On its southern slope *Xanthorrhœa australis*, *Eucalyptus polyanthemos*, and *Pteris aquilina* flourished, to the exclusion of other species of vegetation, whilst the northern declivity supported the *Xanthorrhœa*, *Acacia pycnantha*, the fern *Chilianthes tenuifolia*, and eucalypts *E. polyanthemos*, *E. hemifolia*, *E. leucoxydon*, and *E. elaeophora*. The banks of the small gully which meandered through the valley were margined by *Correa speciosa* and extensive growths of *Helichrysum semipapposum*. Here, amongst the dwarf specimens of eucalypts, *Glycine clandestina* was found twining in profusion, and also, as is usual in such situations, *Clematis microphylla*. Here, too, numerous representatives of the feathered tribe were noted. Quitting the interesting country at the foot of the range, we headed east across the plain, traversing many patches of *Eutaxia empetrifolia*, whose orange-red inflorescence enlivened the green sward. At noon we halted for lunch beside a waterhole in which was a family of Wood-Duck, male and female and twelve young.

A striking topographical feature, which the wayfarer will not fail to observe, is the numerous shallow depressions of varying area on the basaltic plain hereabouts. They are invariably margined by angular flakes of bog-iron ore, the oxide being derived probably from the disintegration of the basalt, and nourish to a lesser or greater extent sturdy specimens of *Polygonum Cunninghamii* or "Lignum." In several of these swamps we found the Nardoo plant, *Marsilea quadrifolia*, the spores of which the ill-fated Burke and Wills were compelled to use for food.

During the remainder of our journey the usual plants found on the plains were met with, chief amongst these being *Gnaphalodes uliginosa*. The Geelong-Bacchus Marsh road was reached in the neighbourhood of Mr. Dan Green's residence, about three miles south of Parwan railway station.

Hereabouts on either side of the road are two large depressions.

That on the east is still in its natural condition, overgrown with *Polygonum* and large gums, whilst that on the west nourished a heavy crop of oats. At one time these depressions were invariably filled with water, and were favourite resorts for wild-fowl. Some years ago, when both swamps were filled to their utmost capacity, a large circular hole suddenly formed in the roadway. Into this aperture the water from the western swamp quickly drained, making in its transit to the subterranean channel a loud, rushing sound. Since then no water has collected in the depression, which, as previously stated, is now under cultivation. The exact site of this area of subsidence may still be determined. In the eastern swamp a deep circular hole may be seen, which would appear to show that a precisely similar occurrence happened there, with like results. The formation is volcanic, and what is undoubtedly a large extinct crater is situated at no great distance. From a well sunk in the neighbourhood clear, sparkling water is obtained, but it is far too saline for stock or for irrigation purposes.

Mr. Green, at whose residence we rested for several hours, kindly drove us to the Parwan station, where twenty minutes' shivering disquietude were passed before our train arrived.

Despite occasional showers and the prevailing boisterousness of the wind, the trip, though not so extensive as we had at first contemplated, was, on the whole, an enjoyable and an interesting one, and if the country traversed presented no striking physical features, or the vegetation it nourished failed to compare in variety and luxuriance with that to be met with in less remote spots, there was nevertheless some latent charm about it which gratified our natural instincts and afforded us the liveliest interest while wandering through its solitary wastes.

The following list of the birds noted during the trip may be useful for reference, and numbers fifty-nine species :—

Blue Wren	Black-and-White Swallow
Black Duck	House-Swallow
Black-faced Graucalus	Wood-Swallow
Black-throated Grebe	Brown Flycatcher
White-fronted Heron	White-shafted Flycatcher
Wood-Duck	Black-and-White Flycatcher
White-breasted Cormorant	Restless Flycatcher
Nankeen Kestrel	Spotted Ground-bird
Brown Hawk	White-browed Babbler
Sulphur-crested Cockatoo	White-fronted Chat
Crimson Lory	Reed-Warbler
Rosehill Parrakeet	Striated Tit
Brown Kingfisher	Yellow-rumped Tit
Fan-tailed Cuckoo	White-fronted Scrub-Wren
Pallid Cuckoo	Harmonious Thrush
Narrow-billed Cuckoo	Magpie-Lark

White-backed Magpie
 Crested Shrike-Tit
 White-throated Thickhead
 Rufous-breasted Thickhead
 Orange-winged Sittella
 White-throated Tree-creeper
 Brown Tree-creeper
 Silver-eye
 Mistletoe-Swallow
 Orange-tipped Pardalote
 Spotted Pardalote
 Lunulated Honey-eater
 Spinebill Honey-eater
 White-eared Honey-eater

White-plumed Honey-eater
 New Holland Honey-eater
 Crescent Honey-eater
 Spiny-cheeked Honey-eater
 Noisy Miner (Minah)
 Red Wattle-bird
 Ground-Lark
 Spotted-sided Finch
 Red-browed Finch
 Raven
 White-winged Chough
 Scarlet-breasted Robin
 Hooded Robin

ON THE NEST AND EGGS OF THE LARGE-TAILED GRASS-WREN, *AMYTIS MACRURUS*, GOULD.

BY ALFRED J. NORTH, C.M.B.O.U., C.M.Z.S., Ornithologist to the Australian Museum, Sydney.*

(With plate.)

(Read before the Field Naturalists' Club of Victoria, 17th Jan., 1910.)

MR. George Masters, Curator of the Macleay Museum, at the University of Sydney, informed me that on one occasion many years ago while collecting in south-western Australia on behalf of the Trustees of the Australian Museum he met with a small flock of *Amytis macrurus* in the scrub, bobbing up and down like tennis balls as they hopped over the ground only a few yards away from him. Having his gun heavily loaded for wallaby, he did not fire, and the opportunity to secure this species did not present itself to him again. Until recently this was the only instance I knew of anyone meeting with the bird since Gould described it.

Of comparatively recent years, however, this species has been obtained, if *Amytis gigantura*, Milligan, the *Amytornis megalurus* of Sharpe, be identical with it (I have pointed out elsewhere the discrepancy in Gould's dimensions of *Amytis macrurus* in his original description in the "Proceedings of the Zoological Society" and his "Handbook to the Birds of Australia" †), while Mr. Tom Carter described it later under the name of *Amytornis varia*.

During 1909 Mr. Chas. G. Gibson, Assistant Government Geologist of Western Australia, sent me skins of *Amytis macrurus*, collected near Kalgoorlie, Western Australia, and at various times since 29th August, 1909, sent me information relative to finding its nests and eggs. Three sets of their eggs

* Contributions from the Australian Museum, by permission of the Trustees.

† Horn. Exped. Centr. Aust.—Zool., p. 81 (1896).

PLATE IV.



NEST AND EGGS OF LARGE-TAILED GRASS-WREN

(*Amytis macrurus*, Gould).

Photo. by C. G. GIBSON.

have just been received for description, accompanied by a photograph taken by Mr. Gibson of the nest and eggs *in situ*, and with the following field notes :—

“ With regard to the finding of the nests of the Large-tailed Grass-Wren (*Amytis macrurus*), the first was made on 29th August, 1909, as I was working through a clump of thick bush, when one of the birds suddenly flew out of a thick prickly bush just in front of me; investigation revealed, much to my delight, a nest right in the centre of the bush containing three slightly incubated eggs. This nest was about two feet from the ground. Next day I visited a similar clump of brush where I had noted a pair of birds a couple of weeks previously, and within ten minutes had dropped across a nest in an almost identical position; this nest was apparently just ready for eggs, and on returning in four or five days I was, to put it mildly, somewhat disgusted to find two broken eggs under the nest, evidently the work of a lizard. However, in about a fortnight's time I had the satisfaction of finding the nest of the same pair of birds in a very similar position not a hundred yards from the original spot. In the meantime I had visited the scene of the original find and again obtained a set of three eggs in a similar bush about twenty yards from the first one; this was the last I saw of this pair of birds. The scene of the second find was a small thicket, extending some 40 chains by 20 chains, about 4 miles out of Kalgoorlie. I visited the spot regularly about every fortnight, with the results shown. The skin sent was from here, and apparently one of the third pair. In every case the new nest was found within a hundred yards of the original one and generally in a very similar position. There were three pairs of birds in this thicket, but I could not locate the third nest; I doubt if the birds built. In every case the nests were left for a day or two after the two eggs were laid, so that the clutches are complete. The bush in which the photographed nest is situated was opened out so as to enable the photograph to be taken. A similar nest taken 80 miles east of Laverton early in November, 1905, contained one addled egg and a small young bird; the egg was very similar to those of the set of three.

“ The following are the dates of taking nests :—

1909.

* 29th August, with 3 eggs, slightly incubated	} Same pair birds, sets very similar.
14th September, 3 eggs, fresh	...	...
16th September, 2 eggs, slightly incubated	} Same pair birds, all sets of eggs very similar.
29th September, 2 eggs, fresh	...	...
* 12th October, 2 eggs, fresh (1 egg marked on small end)	...	...
In addition, 30th August, nest nearly built, 2 broken eggs under nest, 4 days later	...	...

This pair of birds very tame (near nest), others usually extremely shy.

* Sets sent for description.

29th September, 2 eggs, slightly incubated	} Same pair birds, sets very similar.
* 12th October, 2 eggs, fresh (see Plate IV.)	...	...
24th October, 2 eggs, very slightly incubated (1 egg addled)	...	...

"The birds are usually found in thick brush thickets, rarely in the open.

"The nest is the usual bulky grass structure, with very little 'roof.' The entrance is near the top, and is large, the eggs being plainly visible from outside; no lining beyond fine grasses is used in the nest. The lower part of the nest is strongly made, but the upper part is very loosely put together (see Plate IV.)

"The nest is usually placed in the centre of a low, thick bush, and varies from 1 to 2½ feet from the ground. The nest photographed was about 12 inches from the ground."

Of the nine nests found, seven contained sets of two eggs in each, some of them being slightly incubated; the remaining two nests (sets of three eggs in each), one slightly incubated, the other fresh. As Mr. Gibson points out, two pairs of birds yielded three sets of eggs, the laying season, doubtless owing to their being robbed, extending from the 29th August to the 24th October, 1909, inclusive. The eggs vary from rounded oval to somewhat lengthened oval in form, the shell being close-grained, smooth, and lustrous. Typically they are white, or of a very faint reddish-white ground colour, over which are sprinkled dots and small irregular-shaped spots and a few blotches of rich red or purplish-red, and having similar, but fewer, underlying markings of lilac-grey, all of them being more thickly disposed towards the larger end, where they are confluent, and assume the form of an irregular zone. A set of three eggs, taken on the 29th August, measure—(a) 0.78 x 0.63 inches; (b) 0.79 x 0.64 inches; (c) 0.78 x 0.63 inches. A set of two taken from the nest photographed, on the 12th October, measure—(a) 0.91 x 0.65 inches; (b) 0.93 x 0.65 inches. An unusually coloured set, differing from any eggs I had seen of *Amytis*, are of a salmon-red ground colour, sparingly sprinkled over one specimen, but numerous on the other, with dots and small irregular spots of a darker shade of the ground colour, the latter having a broad clouded band of a still darker hue, shaded with purple, on the larger end, and the former a similar band around the smaller end of the shell. These eggs measured—(a) 0.87 x 0.65 inches; (b) 0.87 x 0.66 inches.

Typical eggs of *Amytis macrurus* resemble in colour and markings lightly marked eggs of *Cinclorhamphus rufescens*; the last described set more resemble the eggs of *Meliphaga phrygia*.

The accompanying plate is the first which has been published of the nest of any species of *Amytis*.

* Set sent for description.

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FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 14th February, 1910.

The president, Prof. A. J. Ewart, D.Sc., occupied the chair, and about 60 members and visitors were present.

REPORTS.

A report of the excursion to West Warburton, from Saturday to Monday, 29th to 31st January, was given by the leader, Mr. A. D. Hardy, F.L.S., who said that the locality of the excursion, which was originally fixed for Gilderoy, *via* Yarra Junction, had to be altered to West Warburton, owing to all the accommodation at the former place having been taken up. The first day had been spent in the lower country along the banks of the Yarra; on the next day the valley of the Dee was visited, and the high range at its source, about 3,350 feet above sea level, ascended. On the way up a fine beech grove had been passed through. A number of interesting plants had been met with, and the locality was a good one for those who wished to obtain seedlings of native plants for home cultivation. On the last day the Britannia Creek district was visited, which presented vegetation of quite a different character. Altogether an interesting outing was spent, though, probably on account of the dry weather, bird and insect life seemed to be very scarce.

A report of the excursion to Port Melbourne Beach on Saturday, 12th February, was forwarded by the leader, Mr. C. J. Gabriel, who said that there had only been a small attendance, members apparently judging that the afternoon's results would not be very remarkable. They had, however, found sufficient types of shells to form the foundation for a half-hour's chat, and he had called attention to some interesting facts—notably, the enormous increase in recent years of the bivalve *Spisula parva*, Petit, which at one time was rarely found nearer Melbourne than the mud-banks towards the Heads. He also gave some account of the life-histories of the wood-boring molluscs, so destructive to jetties and other marine structures. The only plants noticed in bloom near the shore were *Mesembryanthemum australe* and *Frankenia laevis*. In order that members might see what shells may be found on Port Melbourne Beach, especially after a storm, he forwarded as an exhibit some of the more notable species.

A report of the junior excursion to Willsmere, Kew, on Saturday, 5th February, was given by the leader, Mr. A. D. Hardy, F.L.S., who said that the excursion had been fairly well attended,

and great interest in the work had been evinced by the juniors. The afternoon was devoted to the pond-life to be found in the lagoons there. Some attention was paid to the aquatic plants, *Ottelia ovalifolia* being noted in bloom, others recorded being *Potamogeton natans*, *P. obtusus*, *Heleocharis sphacelata*, *Polygonum minus*, *P. strigosa*, *Utricularia flexuosa*, *Triglochin procera* and *Myriophyllum varicifolium*; with *Nitella*, sp., *Volvox globator*, and *Closterium Ehrenbergi* among the lower forms. Animal life did not seem particularly abundant, but some fine colonies of the rotifer, *Lacinularia pedunculata*, were collected.

ELECTION OF MEMBERS.

On a ballot being taken, Miss K. Crawford, Motherwell-street, Hawksburn, was elected an ordinary member, and Miss Flora E. Dainty, Harold-street, Middle Park, an associate member of the Club.

GENERAL BUSINESS.

The president took occasion to welcome to the meeting Mr. T. Steel, F.C.S., of Sydney, a former member of the Club, and one still interested in its welfare. Mr. Steel, in thanking the members for their cordial reception, said that he followed the Club's doings with interest, by means of the *Naturalist*, every month, and was pleased to notice its steady advancement. He desired to convey the good wishes of the New South Wales Naturalists' Club, and hoped some of the neglected branches of natural history would claim their devotees ere long.

The Chairman announced that the resignation of Mr. R. W. Armitage of the office of assistant hon. secretary and librarian had been handed in on account of pressure of work, and hoped someone would come forward to fill the vacancy.

PAPER.

By Mr. C. L. Barrett, entitled "The Birds of Eyre Peninsula, South Australia."

This took the form of a lecturette, illustrated by lantern slides of scenes and incidents connected with the annual camp of the Australasian Ornithologists' Union, held in October last on Eyre Peninsula, S.A., where Warunda, inland some twenty miles from Port Lincoln, was the chosen spot. The locality proved a good one for birds, and photographs of the nests and eggs of a number of interesting species were shown on the screen. The Yellow-banded Parrakeet, *Barnardius zonarius*, Shaw., often known as the "Port Lincoln," from the locality, was found not to be so plentiful as formerly, owing to the expansion of settlement. On a small island off the west coast pictures were secured of the nesting-places among the rocks, almost within reach of the waves, of the beautiful Rock Parrakeet, *Neophema petrophila*, Gld. A

visit was paid to some old kitchen-middens, where a number of aboriginal implements, such as scrapers, spear-heads, &c., were secured.

Mr. G. A. Keartland said that even if the Port Lincoln Parrot was becoming scarce in that district, there was no fear at present of its extinction, as its range extended through the centre of the continent towards the west.

Dr. Hall said that it was curious to notice that the islands off the coast in the vicinity of Port Lincoln had been named by Flinders after the names of the various farms in the neighbourhood of his birthplace in Lincolnshire, England.

Owing to the lateness of the hour, papers by Mr. F. Chapman, A.L.S., and Mr. A. D. Hardy, F.L.S., were postponed.

NATURAL HISTORY NOTES.

Mr. J. H. Gatliff drew attention to a list of the land shells of Australia recently published by Dr. J. C. Cox, of Sydney, a well-known collector and authority on Australian land shells, and said that the number of species recorded for Victoria was about nineteen, including three introduced species.

Mr. F. Pitcher drew attention to the recent flowering in the Nymphaea Lake in the Botanic Gardens of the Sacred Lotus, *Nelumbium speciosum*, and said it was probable that further flowers would expand during the next few weeks.

EXHIBITS.

The following were the principal exhibits :—

By Mr. C. L. Barrett.—Nest and eggs of Tawny-crowned Honey-eater, *Glycyphila melanops*, with two clutches in the same nest, from Mortlock, Eyre Peninsula, S.A.; grinding stones, quartz scrapers, &c., from Eyre Peninsula.

By Mr. F. G. A. Barnard.—Growing fern, *Lomaria vulcanica*, from Cradle Mountain, Tasmania.

By Mr. C. J. Gabriel.—Victorian shells, representative of species to be found on Port Melbourne Beach, viz. :—Bivalves.—*Chione disjecta*, Perry; *C. nitida*, Q. and G.; *C. strigosa*, Lam.; *Arca fasciata*, Reeve; *A. trapezia*, Desh.; *Tellina deltoidalis*, Lam.; *Soletellina douacioides*, Reeve; *Anatina creccina*, Reeve; *Spisula parva*, Petit; *Mesodesma nitida*, Desh.; *Dosinia circinnaria*, Desh. Univalves.—*Nassa labecula*, A. Ad.; *N. pauperata*, Lam.; *N. fasciata*, Lam.; *Natica didyma*, Chem.; and *N. conica*, Lam.

By Mr. P. R. H. St. John.—Flowers of *Eucalyptus tetragona*, F. v. M., Western Australia, and *Backhousia citriodora*, F. v. M., Lemon-scented Myrtle, Queensland, grown in Melbourne Botanic Gardens.

After the usual conversazione the meeting terminated.

VICTORIAN VEGETATION IN THE MELBOURNE
BOTANIC GARDENS.

By F. PITCHER.

(Read before the Field Naturalists' Club of Victoria, 17th Jan., 1910.)

IT is hardly to be expected that one could find anywhere within a radius of $2\frac{1}{2}$ miles of the centre of so prosperous a State capital as Melbourne even the smallest area of land in anything like the natural condition in which it existed seventy years earlier, to say nothing of ever hoping to trace within such an area a mass of vegetation anything approaching the natural condition in which it existed prior to that time. It may, however, be remarked with a great deal of pleasure, and to the credit of the persons concerned, whether they have passed away or are still living, that there are yet to be seen, within a very short distance of Melbourne, in our Royal, Studley, Richmond and Yarra parks, numerous specimens of Eucalyptus, Casuarina, and Acacia, now, perhaps, of very limited species, which serve to indicate, in part, the character of the natural vegetation which existed on the site of our city prior to its discovery and subsequent settlement. In addition, there yet remain to-day along the banks of the River Yarra, on which our city is built, and its tributary creeks, within a very short distance of the metropolis, Acacia, Bursaria, Melaleuca, and other plants in their natural condition, which afford additional evidence of the character of the vegetation which previously occupied the site of Melbourne and its flourishing suburbs.

Now, when we consider that in the small area so wisely selected by the first Lieutenant-Governor of Victoria, the Hon. Charles Joseph La Trobe, in 1840 as a Botanic Gardens site, since increased to about 100 acres, there have been going on continuous changes and transformations of the surface conditions, such as by the erection of a stately vice-regal residence in its vicinity; the providing of suitable approaches and thoroughfares to and from the city for its population living in the adjoining southern suburbs; the improvements of the course and southern bank of the Yarra, which forms one of the boundaries of the site; and, last but not least, the remodelling and improving of the Gardens themselves according to the varying ideas of the different directors from time to time during the period named, it is almost unreasonable to think that any native vegetation would remain of that which existed prior to the discovery of the State, yet there are still a few trees living within our Botanic Gardens which were flourishing on the site before the advent of the first of our white population. It is to draw attention to these, with the hope of their being retained as long as ever possible as memorials of such original vegetation, that they are here referred to and their condition at this date mentioned.

PLATE V.



SWAMP TEA-TREES, *MELALEUCA ERICIFOLIA*, SMITH.
(Portion of original vegetation, Melbourne Botanic Gardens).

For a number of years after 1869, when the writer was first introduced to the office and service of the late Baron von Mueller by Mr. A. C. Neate, a faithful former official of the Gardens staff for over 40 years, there remained in the north-eastern portion of the grounds an island area cut off from the surrounding land by a narrow strip of the then lagoon waters. This area was densely covered with the Swamp Tea-tree, *Melaleuca ericifolia*, which in many parts was surmounted with the Scrub Vine, *Cassytha melantha*. Clumps of the Sword Rush, *Lepidosperma elatius*, were scattered amongst this tea-tree, and several Red Gum trees, *Eucalyptus rostrata*, were striking objects in the vicinity, while around the margins and in the adjoining lagoon-waters were thriving luxuriantly, in their natural condition, numerous aquatic plants, including the Native Bulrush, *Typha angustifolia*. Patches of the tea-tree are still to be found growing in this locality, and are shown in the photographs here to-night. These I had taken some time ago with the object of retaining a remembrance of the existence of this wild corner should those patches be found to vanish by reason of further artificial alteration of the surface, or by the requirements of exotic vegetation in their vicinity. In the photograph reproduced as Plate v., the tea-trees will be distinctly noticeable on account of their prominent white stems and umbrella-like heads of foliage. One of the *Eucalyptus rostrata* trees referred to still remains, and is known by photographers and others as the "Artists' Tree," as from near to it some fine views of the lake, Gardens, and Government House are frequently photographed and sketched. This area, of which so few remnants now mark its existence, was for a number of years a charming piece of natural vegetation, and might have remained so until now but for alterations deemed necessary by the authorities and by reason of the Yarra improvements in the vicinity. In the north-west corner of the lake may still be seen a few isolated plants of the same species of *Melaleuca* which existed as part of the lagoon vegetation before the Gardens were established.

On what is now known as Princes' Lawn, on the western side of the Gardens, are to be seen two fine specimens of the Red Gum, *Eucalyptus rostrata*. These have been silently making life in their present position throughout the whole history of the Gardens, and indicate their claim for consideration in connection with the natural vegetation in existence when the site of the Gardens was selected. These trees also serve to locate a spot in their vicinity where over thirty years ago a small zoological collection, principally monkeys and birds, was situated, and which no doubt interested some of the then visitors to the Gardens. These two trees are features of the Princes' Lawn, and the late Director, Mr. W. R. Guilfoyle, a short time ago, very

wisely had a quantity of English ivy, which had been planted at their bases to improve their appearance and had grown up the trunks, removed, as it was found that such was injuring the specimens, to their possible early destruction. These trees are each over 50 feet in height. One of them is much more lateral in its branching than the other, and the radius of its shade on a bright day averages a distance of over 40 feet from the trunk.

Another example of the original vegetation on the Gardens site is the old gnarled and grey-stemmed specimen of the same eucalyptus, *E. rostrata*, situated a little easterly from the newly erected tea kiosk on the southern edge of the Tennyson Lawn. This specimen, which is known as the "Separation Tree," had, during the late Director's term of office, on many occasions appeared to be dying, but by various treatments—sometimes by surface soakage and other times by drainage—it has been kept alive, and is to-day more vigorous than on many occasions during the writer's long and respectful observation of it. It is hoped that this specimen will be cherished and maintained as long as possible, and be remembered as having been an old tree when, on 1st July, 1851, there assembled at its base and under its foliage a company of people to celebrate the separation of our present State of Victoria from the mother State of New South Wales.* Plate VI. is taken from a recent photograph of this tree.

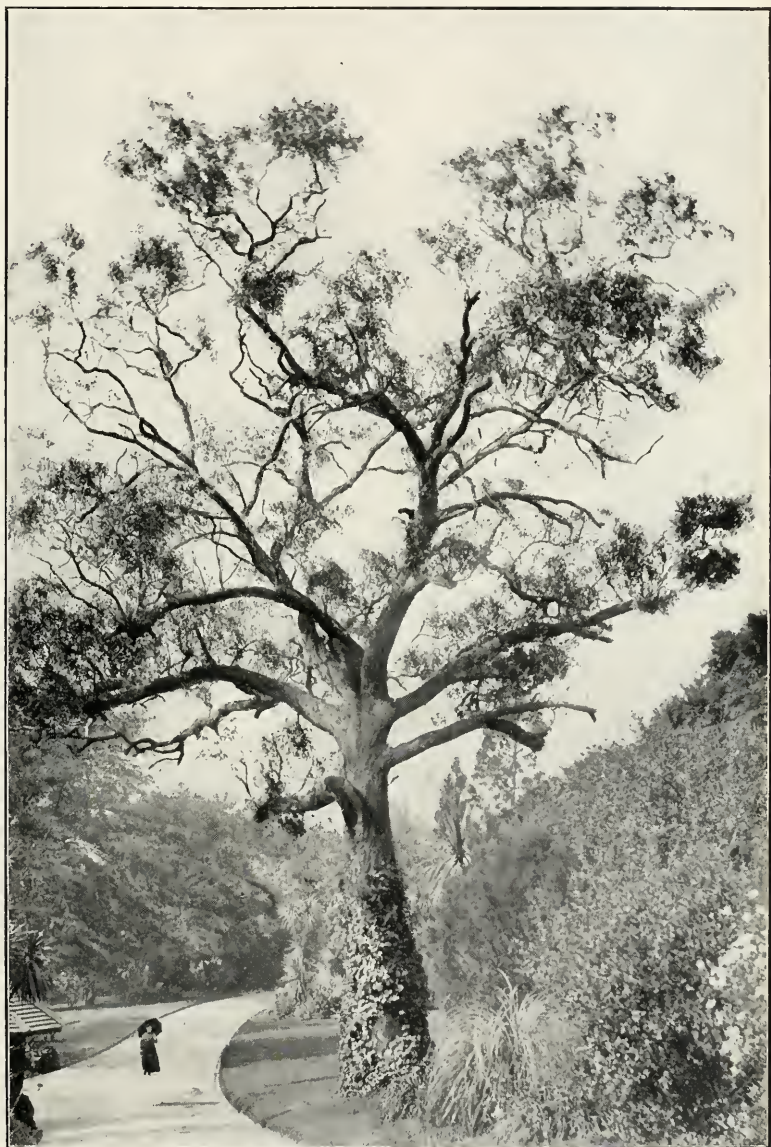
The only other remaining tree which one is able definitely to point out as having been in existence before the establishment of the Gardens is a specimen of the Victorian Manna Gum, *Eucalyptus viminalis*. It is situated on the Western Lawn, near the Gardens office. The tree is at present almost entirely covered with English ivy, which for many years has made it a picturesque object, but which seems to be effectively, if but slowly, destroying it. The area in which this tree is located was formally included in the Domain.

In addition to these few examples mentioned one may observe in the Domain and in one or two spots in the Gardens, growing in a natural state, similar plants to those which originally existed, such as *Bursaria*, *Casuarina*, *Myoporum*, *Leptospermum*, Silver, Black, and Golden Wattles, *Kennedya prostrata*, *Drosera*, *Burchardia*, and other smaller plants and grasses. These, however, are only such as have been self-perpetuated from those existing previously.

In passing on now to the cultivated Victorian plants which are to be found growing in the Gardens, some general observations may be made. While there are so many and varied requirements which a public botanic garden might reasonably be expected to

* A slight error crept into the recently published guide book to the Gardens, where it is stated 'the assemblage resolved on the separation, instead of met to celebrate the same.

PLATE VI.



RED GUM, *EUCALYPTUS* *ROSTRATA*, SCHL.
("The Separation Tree," Melbourne Botanic Gardens.)

serve or meet, one should be to furnish its visitors with examples of the general types of the flora of the country in which such a garden is positioned. This may seem a superfluous remark, but from the experience one has had, both from observation and reading, as well as from the remarks of visitors, the aim of the authorities of many botanic and other public gardens seems to be to acquire as large a collection of exotic plants as possible, to the exclusion of the native flora of the local region or country—a striking proof of the truth underlying the old adage, which, if varied to suit the case, would read—"A plant is not without honour save in its own country." It must not be thought for a moment that I am claiming this to be a paramount object of a botanic garden, but visitors from different States and other countries should be able, for various reasons, to see a fairly good representative collection of types of a country's vegetation in the principal botanic gardens of that country, to say nothing of the possible value to the local residents in having such types grown in cultivation and their nomenclature displayed. It may be said, however, with a degree of pride and congratulation, that the late Director did not exclude suitable indigenous vegetation from the Melbourne Botanic Gardens, for out of an approximate total of 2,000 species which constitute the Victorian flora no less than 400 are to be found in cultivation in the Gardens. This may at a first thought seem to be a very small proportion, but it has to be borne in mind that a large number of our indigenous plants, like those of any other country, are too insignificant for cultivation, and are of no popular interest whatever, while many others it would be either impossible or undesirable to grow and maintain owing to the unsatisfactory reward for the labour which it would be necessary to bestow on them in the endeavour to do so. When it is remembered that in the case of many of the 400 distinct species represented there are numerous examples scattered throughout the grounds, the statement that our native vegetation has not been neglected in the endeavour to make the institution educationally interesting, and attractive to visitors in other directions, will be readily admitted. Hence the collection, within an area of about 100 acres, of so large a number of plants, brought from habitats of varying longitudes and latitudes throughout the State, with the attendant differences in situation of mountain heights or river or creek valleys, from diversified soils, from dry or wet positions, from coastal or inland districts, may be considered fairly satisfactory, especially in view of only general attention being available for their growth and maintenance.

While by far the largest number of Victorian plants are to be found in the extensive area devoted to Australian vegetation established by the late Director several years ago, and which

extends from the office entrance (gate F) along the western, southern, and portion of the eastern boundary fence to the reservoir enclosure, numerous specimens are to be seen scattered throughout the whole of the grounds. The two largest genera in the Victorian flora—*Acacia* and *Eucalyptus*—containing respectively about fifty-four and forty species, are represented in the Gardens collection by no less than thirty-four species of the former and thirty-six of the latter. In addition to the good specimens of *Eucalyptus botryoides*, Mahogany Gum, observable in and close to the Australian plantation, one very fine example is to be found on the Hopetoun Lawn. Some good trees of *E. hemiphloia*, Common Box, and *E. rostrata*, Red Gum, are growing in the border along the Anderson-street boundary fence, while close together on the margins of the Central and Eastern Lawns are good examples of *E. sideroxylon*, Ironbark, and *E. pilularis*, Great Blackbutt. Although the majority of the species of *Eucalyptus* and *Acacia* are to be found in the Australian border, various specimens of *Acacia*, such as *A. pycnantha*, *A. dealbata*, *A. armata*, *A. implexa*, and *A. lunata*, are to be met with in different parts of the grounds, while a number of them are to be found in the border skirting Government House grounds, between the Avenue entrance (gate G) and the Temple of the Winds. Of the nineteen species of *Melaleuca* and *Leptospermum* genera, both familiarly known as "Tea-trees," thirteen species are growing in the Gardens; of the *Callistemon* genus, familiarly known as "Bottle-brushes," five species are in cultivation of the six found in Victoria. In the remarkable order *Proteaceæ*, some good specimens of *Banksia* and other Victorian genera are to be found in the grouping of that order on the Oak Lawn. Of the interesting *Grevillea* genus, nine out of the twenty native species are in the Gardens. Of the Victorian eleven—not cricketers, but *Hakeas*—eleven species are to be found; and of the *Casuarina* or "Sheoak" family, consisting of eight Victorian representatives, four are observable. The only indigenous member of the order *Palmæ*, *Livistona australis*, Cabbage Palm, is to be observed scattered about throughout the whole of the Gardens, where the numerous specimens were planted for their distinctive foliage effects. The largest one, over thirty feet in height, is on the south side of the main pathway which crosses the fern-ground.

Victorian ferns are to be found, if not in great variety yet in large numbers, in and about the fern-gully and adjacent area. Four of the tree-ferns—viz., *Dicksonia antarctica*, Woolly-stemmed Tree-fern, *Alsophila australis*, Hill Tree-fern, *Cyathea medullaris*, Black-stemmed Tree-fern, and *C. Cunninghamii*, Cunningham's Tree-fern, are there represented. Of the first two named some hundreds of specimens of varying heights were

selected over twenty-five years ago from Gippsland, and about five years ago from Fernshaw, by the writer. These still aid in making the fern-ground a most naturally picturesque and attractive resort. The only two specimens of *Cyathea Cunninghami*, sometimes called the Rat-tail Tree-fern, owing to its thin stem, are good ones, each about eight feet in height. They were carried by a friend for several miles on a pack-horse to a Gippsland railway station and forwarded to the Gardens about four years ago. Other native ferns growing in the required sheltered positions in the fern-ground represent different species of the genera *Lomaria*, *Aspidium*, *Asplenium*, *Polypodium*, *Blechnum*, *Pteris*, *Davallia*, and *Todea* (*Osmunda*).

As a complete alphabetical list of the Victorian plants in cultivation in the Gardens at the present date is appended, it will not be necessary to further specialize in any way, particularly as remarks on the growth and culture of Victorian plants in the Gardens may form the subject of another paper on some future occasion. In this list each plant is recorded under the scientific name adopted by Bentham and Mueller in their "*Flora Australiensis*."

The common names have been selected, with the aid of Mr. W. R. A. Baker, who has charge of the Gardens herbarium, from the manuscript records used for general plant nomenclature in the Gardens. These common names, however, must not be considered to have the sanction of, or in any way prejudice the work of our Plant Records Committee in the extremely difficult task it has in hand. At the same time they may be helpful to and worthy of consideration by the Committee.

By the use of reference letters the character of each plant is indicated, whether it be a tree, a tall shrub, a shrub, a dwarf plant, a climber, &c.; but it must be distinctly understood that these particulars are only given in the light of the condition of the plant as in cultivation in the Gardens. There also is given, as the result principally of my own recording, the month of flowering of each flowering plant. This, it must also be pointed out, may prove to be subject to slight variations owing to differing characters of the same seasons and varying differences of the localities in which the same plant is to be found. It will therefore be remembered that this information, however valuable it may be, has relation to the plants in cultivation in the Gardens.* This list may also prove of value in encouraging members to name other plants not included which they may deem suitable and worthy, for specific reasons, of inclusion in the Gardens collection, and may even stimulate some to forward such specimens to the Gardens for culture.

* The months mentioned are those in which the principal flowering occurs, and may not be the only period of flowering, as the preceding and following months may find the plant in flower also.

All has not been done, however, in regard to our native vegetation in the Gardens that perhaps might have been. It may be possible to further develop an increasing interest in our native flora by enlarging the area devoted to Australian vegetation in the Gardens for Victorian species, and in indicating by a specially tinted label in that plantation all such species, so that they may be readily observed by visitors; or by setting apart an additional area in the vicinity or elsewhere exclusively for Victorian plants.

In order to make this paper of somewhat practical value, I would like to suggest to my fellow-members and to readers of the *Victorian Naturalist* that our native plants should not be overlooked when planting their estates or city or suburban gardens, as I hold that for beauty of foliage or flowers (both in many instances united), effective handsomeness of general appearance, and capability of ready cultivation with ordinary care and attention, numbers of such plants cannot be surpassed for the purpose, and become increasingly valuable for mingling judiciously with other familiar and desirable exotic vegetation.

To show that a large number of Victorian plants are available for different purposes of a general gardening character, I append a series of selections of six species. In each case this has been made from those which from one's experience of their cultivation and growth in the Botanic Gardens, as well as observation of them elsewhere, have either proved or suggested them to be the best or good typical plants of their kinds and suitable for the purposes specified. Every selection has been made with a view to provide species having distinctive characteristics—this in order to allow of one or more, or even the whole six, being planted, as considered desirable.

The following are the lists:—

Six Acacias.—*A. acinacea*, *A. discolor*, *A. lunata*, *A. myrtifolia*, *A. oxycedrus*, and *A. pycnantha*.

Six Eucalypts.—*E. amygdalina*, *E. botryoides*, *E. hæmastoma*, *E. melliodora*, *E. rostrata*, and *E. sideroxylon*.

Six Ornamental Trees.—*Angophora intermedia*, *Banksia integrifolia*, *Callitris cupressiformis*, *Elæocarpus cyaneus*, *Exocarpus cupressiformis*, and *Pittosporum undulatum*.

Six Ornamental Tall Shrubs.—*Nephelium leiocarpum*, *Bursaria spinosa*, *Melaleuca Preissiana*, *Myrsine variabilis*, *Tristania laurina*, and *Westringia rosmariniformis*.

Six Ornamental Flowering Shrubs.—*Callistemon lanceolatus*, *Calythrix Sullivani*, *Epacris longiflora*, *Eriostemon myoporoides*, *Prostanthera lasianthos*, and *Thryptomene Mitchelliana*.

Six Smaller Flowering Shrubs.—*Bauera rubioides*, *Bossia cinerea*, *Grevillea ericifolia*, *Hibbertia stricta*, *Leucopogon virgatus*, and *Tetradlea ciliata*.

Six Plants suitable for Undergrowths, or surface covering of the

ground.—*Kennedy* prostrata, *Mesembryanthemum æquilaterale*, *Myoporum humile*, *Olearia ramulosa*, *Plectranthus parviflorus*, and *Scævola suaveolens*.

Six Creepers or Climbing Plants.—*Aphanopetalum racemosum*, *Clematis aristata* or variety *Dennisæ*, *C. microphylla*, *Eustrephus latifolius*, *Hardenbergia monophylla*, and *Tecoma australis* or variety *Latrobei*.

Six Hedge Plants.—*Acacia armata*, *Coprosma Billardieri*, *Hakea acicularis*, *Leptospermum lævigatum*, *Myoporum viscosum*, and *Pittosporum undulatum*.

Six Hardy Ferns for Outdoor Cultivation (if in sheltered positions from winds and too much sunlight).—*Alsophila australis*, *Aspidium aculeatum*, *Blechnum cartilagineum*, *Davallia dubia*, *Dicksonia antarctica*, and *Lomaria discolor*.

My object in placing this paper before you to-night has been threefold—firstly, to draw attention to the few remaining living monuments of the native vegetation which existed when the Botanic Gardens site was selected, in the hope of their further preservation as long as possible; secondly, to give as far as possible a complete list, with particulars, of the fairly large collection of native plants in cultivation at the Gardens at the present date; and, thirdly, to show what a great number of species of our beautiful native flora can be readily grown near Melbourne, with a view of urging lovers of plants and gardens not to overlook the Victorian flora when selecting plants for beautifying and decorating their home surroundings.

This paper may not have been very entertaining, but if it helps in achieving the objects mentioned I shall feel amply rewarded for the labour expended on its preparation.

ALPHABETICAL LIST OF VICTORIAN PLANTS IN CULTIVATION IN THE MELBOURNE BOTANIC GARDENS, DECEMBER, 1909.

The initial letters appended to each plant indicate its character as in cultivation in the Gardens:—

A.P.	Aquatic Plant.	S.	Shrub.
C.	Climber.	S.P.	Small Plant.
D.P.	Dwarf Plant.	S.S.	Small Shrub.
F.	Fern.	T.	Tree.
G.	Grass.	T.P.	Trailing Plant.
R.	Rush.	T.S.	Tall Shrub.

Endemic species and varieties are indicated by an asterisk (*).

Name in "Flora Australiensis."	Authority.	Common Name in Use in Botanic Gardens.	Character.	Months of Flower- ing.
<i>Acacia acinacea</i> ..	.. Lindl.	Governor Latrobe's Acacia	.. S.	Aug, Sep
.. <i>armata</i> ..	.. R. Br.	Kangaroo Thorn ..	.. T.S.	Aug, Sep
.. <i>aspera</i> ..	.. Lindl.	Rough-leaved Acacia	.. S.	Sep, Oct
.. <i>brachybotrya</i>	.. Benth.	Silver-leaved Mulga	.. S.	Sep, Oct
.. <i>calamifolia</i>	.. Sweet.	Broom Wattle ..	.. S.	Sep, Oct

Acacia dealbata	Link.	Silver Wattle	T.	Aug, Sep
„ decurrens	Willd.	Black Wattle	T.	Nov, Dec
„ „ var. mollis	—	Common Black Wattle	T.	Nov, Dec
„ diffusa	Edwds.	Spreading Acacia or Pin-bush	S.	August
„ discolor	Willd.	Sunshine Wattle	T.S.	Apl, May
„ elongata	Siebr.	Long-podded Acacia	S.	Jly, Aug
„ farinosa	Lindl.	Mealy Acacia	S.	Sep
„ hakeoides	Cunn.	Hakea-like Acacia	S.	July
„ homalophylla	Cunn.	Fragrant Myall	T.	Sep
„ implexa	Benth.	Twisted or White-wood Acacia	T.	Jan, Feb
„ juniperina	Willd.	Prickly Wattle	S.	Aug, Sep
„ leprosa	Sieber	Australian Hickory	T.S.	Sep
* „ „ var. elongata	—	Seville Wattle	T.S.	Sep
* „ „ tenuifolia	—	Slender-leaved Australian Hickory	T.S.	Sep
„ linifolia	Willd.	Flax-leaved Acacia	S.	March
„ longifolia	Willd.	Long-leaved Acacia	T.S.	Aug, Sep
„ „ var. sophoræ	—	Spreading Coast Wattle	T.S.	Aug, Sep
„ „ „ floribunda	—	Many-flowered Acacia	T.S.	Aug, Sep
„ lunata	Sieber	Golden Glory Wattle	T.S.	Aug, Sep
„ montana	Benth.	Mountain Wattle	S.	Aug, Sep
„ myrtifolia	Willd.	Myrtle-leaved Acacia	S.	Aug, Sep
„ obtusata	Sieber	Blunt-leaved Acacia	S.	July
„ Osswaldi	F.v.M.	Umbrella-bush or “Nelia”	S.	Oct, Nov
„ Oxycedrus	Sieber	Juniper Wattle	S.	August
„ penninervis	Sieber	Mountain Hickory	S.	Nov
„ pravissima	F.v.M.	Alpine Wattle	S.	Aug, Sep
„ pycnantha	Benth.	Golden Wattle	T.	Aug, Sep
„ retinodes	Schl.	Bald Acacia or “Wirilda”	S.	Sep, Mar
„ salicina	Lindl.	Murray River Willow	T.	Sep, Oct
„ sclerophylla	Lindl.	Hard-leaved Acacia	S.	Oct
„ stricta	Willd.	Upright Acacia or “Berry-Yung”	S.	Aug, Sep
„ suaveolens	Willd.	Sweet-scented Acacia	S.	Sep, Oct
„ verniciflua	Cunn.	Varnish Wattle	S.	Aug, Sep
„ verticillata	Willd.	Whorl-leaved Acacia	S.	Sep
Acæna sanguisorbæ	Vahl.	Burnet-leaved Sheep Burr or “Bidgee Widgee”	D.P.	Nov-Feb
Acronychia levis	Forst.	White Brush-wood	T.S.	—
Acrotriche serrulata	R. Br.	Saw-leaved Hair Sepal or Ground- berry	S.S.	Jly, Aug
* „ „ ventricosa	Luchm.	Warted Ground-berry	S.S.	July
Adiantum Æthiopicum	Linné	African Maiden-hair Fern	F.	—
„ „ formosum	R. Br.	Beautiful Maiden-hair Fern	F.	—
Alisma Plantago	Linné	Water Plantain	A.P.	Dec, Jan
Alsophila australis	R. Br.	Hill Tree Fern	F.	—
Alyxia buxifolia	R. Br.	Heath Box	S.	Feb
Ammobium alatum	R. Br.	Winged Everlasting Flower	D.P.	Dec, Jan
Angophora intermedia	D. C.	Spurious Native Apple Tree	T.	Jan, Feb
Anthistiria ciliata	Linné	Common Kangaroo Grass	G.	Dec, Jan
Aphanopetalum resinosum	Endl.	Gum Vine	G.	Nov, Dec
Apium australe	Thouars	Australian Celery	D.P.	Feb, Mar
Aspidium aculeatum	Swartz	Scrub Fern	F.	—
„ „ eapense	Willd.	Cape Shield Fern	F.	—
„ „ decompositum	Swartz	Common Shield Fern	F.	—
Asplenium flabellifolium	Cav.	Fan-leaved Spleenwort	F.	—
„ „ Nidus	Linné	Bird's-nest Fern	F.	—
„ „ umbrosum	J. Sm.	Shady Spleenwort	F.	—
Astroloma conostephioides	F.v.M.	Flame Heath	S.	Sep, Oct

<i>Astroloma humifusum</i> ..	Pers.	Australian Cranberry	..	..	S.	Jun, July
<i>Atherosperma moschatum</i>	Labill.	Victorian Sassafras	..	..	T.	Sep
<i>Atriplex cinerea</i> ..	.. Poiret	Victorian or Grey Salt-bush	..	..	S.	Oct
„ <i>nummularia</i> ..	.. Lindl.	Old Man Salt-bush	..	..	S.	Oct, Nov
„ <i>vesicaria</i> ..	.. Hew.	Bladder Salt-bush	..	..	S.	Oct, Nov
<i>Azolla rubra</i> ..	.. R. Br.	Floating Pond Moss	..	..	A.P.	—
<i>Backhousia myrtifolia</i>	Hk. & Hvy.	Grey Myrtle	..	..	T.	Dec
<i>Bæckea Gunniana</i> ..	.. Schauer	Gunn's Bæckea	..	..	S.	Dec
„ <i>linifolia</i> ..	.. Rudge	Flax-leaved Bæckea	..	..	S.	Dec
<i>Banksia æmula</i> ..	.. R. Br.	“ Mintee ” or “ Wallum ”	..	..	S.	—
„ <i>collina</i> ..	.. R. Br.	Hill Honeysuckle	..	..	S.	Mar, Apl
„ <i>integrifolia</i> ..	.. Linné	Coast Honeysuckle, “ Pomeria,” or “ Curridjah ”	..	..	T.	Mar, Apl
„ <i>marginata</i> ..	.. Cav.	Common Honeysuckle or “ Wallum Wareek ”	..	..	T.	Mar, Apl
„ <i>serrata</i> ..	.. Linn. f.	Serrated-leaved Honeysuckle or “ Wattung-urree ”	..	..	T.	Feb, Mar
<i>Bauera rubioides</i> ..	.. Andr.	Wire Scrub or River Rose of Tas.	..	..	S.	Sep—Feb
* „ „ var. <i>alba</i>	—	White Wire-Scrub	..	..	S.	Sep—Dec
<i>Beyeria opaca</i> ..	.. F.v.M.	Victorian Wallaby-bush	..	..	S.	Nov
„ <i>viscosa</i> ..	.. Miquel.	Wallaby-bush or Pink-wood	..	..	S.	Dec, Jan
<i>Billardiera scandens</i>	.. Smith	Climbing Apple Berry	..	..	C.	Oct
<i>Blechnum cartilagineum</i>	Swartz	Dog's-tooth Fern	..	..	F.	—
<i>Bossiaea cinerea</i> ..	.. R. Br.	Australian Sun-bush	..	..	S.	Sep
„ <i>cordigera</i> ..	.. Benth.	Heart-leaved Sun-bush	..	..	S.	Dec
„ <i>heterophylla</i> ..	.. Vent.	Various-leaved Sun-bush	..	..	S.	Sep
„ <i>microphylla</i> ..	.. Smith	Small-leaved Sun-bush	..	..	S.	Sep
<i>Bursaria Pantoni</i> ..	.. Guilf.	Panton's Box-tree	..	..	T.S.	Jan, Feb
„ <i>spinosa</i> ..	.. Cav.	Prickly Australian Box	..	..	T.S.	Jan, Feb
<i>Callistemon brachyandrus</i>	Lindl.	Short-stamened Bottle-brush	..	..	S.	Dec, Jan
„ <i>coccineus</i> ..	.. F.v.M.	Pale-red Bottle-brush	..	..	T.S.	Nov, Dec
„ <i>lanceolatus</i> ..	.. D. C.	Lance-leaved Red Bottle-brush	..	..	T.S.	Oct, Nov
„ <i>linearis</i> ..	.. D. C.	Narrow-leaved Bottle-brush	..	..	S.	Dec
„ <i>salignus</i> ..	.. D. C.	Willow-leaved Bottle-brush	..	..	T.S.	Oct, Nov
<i>Callitris calcarata</i>	.. R. Br.	Black Murray Pine	..	..	T.	—
„ <i>cupressiformis</i> ..	.. Vent.	Victorian Cypress or “ Brorogorre ”	..	..	T.	—
„ <i>robusta</i> ..	.. R. Br.	Murray Pine, “ Marro,” or “ Mar- rung ”	..	..	T.	—
„ <i>verrucosa</i> ..	.. R. Br.	Mallee Pine	..	..	T.	—
* <i>Calythrix Sullivan</i>	.. F.v.M.	Sullivan's Hair-cup Flower	..	..	S.	Oct
„ <i>tetragona</i> ..	.. Labill.	Hair-cup Flower	..	..	S.	Oct
<i>Capparis Mitchell</i>	.. Lindl.	Mitchell's Caper Plant or “ Mondo ”	..	..	S.	—
<i>Cassia australis</i> ..	.. Sims	Southern Cassia	..	..	S.	Oct
<i>Cassinia aculeata</i> ..	.. R. Br.	Sharp-pointed-leaved Cassinia	..	..	S.	Nov—Feb
„ <i>spectabilis</i> ..	.. R. Br.	Showy Cassinia	..	..	S.	Jan, Feb
<i>Casuarina distyla</i>	.. Vent.	Stunted She-oak	..	..	T.S.	Aug—Nov
„ <i>glauca</i> ..	.. Sieber	Bench Oak or “ Belar ”	..	..	T.	July
„ <i>stricta</i> ..	.. Aiton	Coast She-oak or “ Worgnal ”	..	..	T.	Apl, May
„ <i>suberosa</i> ..	.. Ot. & Diet.	Erect She-oak or “ Wayetuck ”	..	..	T.	July
<i>Caustis flexuosa</i> ..	.. R. Br.	Australian Curly-wigs	..	..	T.P.	Nov, Dec
<i>Celastrus australis</i>	.. Hvy. & F.v.M.	Australian Staff Vine	..	..	C.	—
<i>Clematis aristata</i> ..	.. R. Br.	Australian Supple Jack	..	..	C.	Nov, Jan
* „ „ var. <i>Dennisæ</i>	—	Pink-coloured Virgin's Bower	..	..	C.	Nov
„ <i>microphylla</i> ..	.. D.C.	Small-leaved Virgin's Bower	..	..	C.	Jly, Aug
<i>Commersonia Fraseri</i>	.. J. Gay	Blackfellow's Hemp	..	..	T.S.	Oct, Nov

<i>Coprosma Billardieri</i>	..	Hook.f.	Wild Currant-bush or "Morr"	..	S.	Sep
<i>Correa alba</i>	..	Andr.	White-flowered Australian Fuchsia	..	S.	Apl, May
<i>Lawrenciana</i>	..	Hook.	Great Australian Fuchsia	..	S.	Apl, May
<i>speciosa</i>	..	Andr.	Australian Fuchsia	..	S.	Apl-Jun
" <i>var. glabra</i>	—		Smooth-leaved Australian Fuchsia	..	S.	May, Jun
" <i>normalis</i>	—		Green-flowered Australian Fuchsia	..	S.	May, Jun
<i>Crinum flaccidum</i>	..	Herb.	Darling River Lily	..	D.P.	March
<i>Cryptandra amara</i>	..	Smith	Australian Heath Spray	..	S.S.	August
<i>Cyathea Cunninghami</i>	..	Hook.f.	Cunningham's Tree Fern	..	F.	—
<i>medullaris</i>	..	Swartz	Black-stemmed Tree Fern	..	F.	—
<i>Davallia dubia</i>	..	R. Br.	Doubtful Hare's-foot Fern	..	F.	—
" <i>pyxidata</i>	..	Cav.	Box-like Hare's-foot Fern	..	F.	—
<i>Daviesia corymbosa</i>	..	Smith	Slender Bitter Leaf	..	S.	Sep, Oct
" <i>latifolia</i>	..	R. Br.	Broad Bitter Leaf	..	S.	Sep, Oct
<i>Dendrobium speciosum</i>	..	Smith	Australian Rock Lily	..	Orchid	Sep, Oct
<i>Dianella elegans</i>	..	Kunth	Elegant Flax Lily	..	D.P.	Dec, Jan
" <i>lævis</i>	..	R. Br.	Smooth-leaved Flax Lily	..	D.P.	Nov, Dec
" <i>revoluta</i>	..	R. Br.	Recurve-leaved Flax Lily	..	D.P.	Oct, Nov
" <i>Tasmanica</i>	..	Hook.f.	Broad-leaved Flax Lily	..	D.P.	Nov, Dec
<i>Dichelachne erinita</i>	..	Hook.f.	Australian Mouse Grass	..	G.	Oct
<i>Dicksonia antaretica</i>	..	F.v.M.	Woolly-stemmed Tree Fern	..	F.	—
<i>Dillwynia cinerascens</i>	..	R. Br.	Pride of the Heath	..	S.	Aug, Sep
" <i>hispida</i>	..	Lindl.	Rough Dillwynia	..	S.	Oct, Nov
<i>Diplarrhena Moræa</i>	..	Labill.	White Butterfly Flag	..	D.P.	Nov
<i>Dodonæa lobulata</i>	..	F.v.M.	Red-fruited Hopseed-bush	..	S.	Sep
" <i>triquetra</i>	..	Wendl.	Three-cornered Hopseed-bush	..	S.	Sep
" <i>viscosa</i>	..	Linné	Hopseed-bush	..	S.	Aug, Sep
" " <i>var. spatulata</i>	..		Victorian Lignum Vitæ	..	T.S.	Sep
<i>Doodia aspera</i>	..	R. Br.	Rough Rasp Fern	..	F.	—
" <i>caudata</i>	..	R. Br.	Tailed Rasp Fern	..	F.	—
<i>Drimys aromatica</i>	..	F.v.M.	Victorian Pepper Plant	..	S.	Sep, Oct
<i>Ehretia acuminata</i>	..	R. Br.	Brown Cedar	..	T.	March
<i>Elæocarpus cyaneus</i>	..	Pers.	Blue Oliveberry-tree	..	T.	Nov, Dec
<i>Eleusine Ægyptiaca</i>	..	Lam.	Finger Grass	..	G.	Nov, Dec
<i>Enchylæna tomentosa</i>	..	R. Br.	Barrier or Downy Salt-bush or " Koo-loo-loo-moo"	..	D.P.	Jan
<i>Epacris impressa</i>	..	Labill.	Wild Heath	..	S.S.	Sep, Oct
" " <i>var. rosea</i>	—		Pink-cornered Wild Heath	..	S.S.	Sep, Oct
" <i>longiflora</i>	..	Cav.	Long-flowered Australian Heath	..	S.S.	Feb-Sep
<i>Eremophila bignoniæflora</i>	..	F.v.M.	Desert Fuchsia, "Pombel," or Emu-bush	..	F.S.	Jan, Feb
" <i>maculata</i>	..	F.v.M.	Spotted-flowered Desert Fuchsia	..	S.	Sep-Oct
<i>Eriostemon myoporoides</i>	..	D. C.	Woolly Stamen-flower	..	S.	Jly-Oct
* <i>Eucalyptus alpina</i>	..	Lindl.	Alpine Gum	..	T.	June
" <i>amygdalina</i>	..	Labill.	Victorian Peppermint Gum	..	T.	Mar
" " <i>v. regnans</i>	—		Giant Peppermint Gum	..	T.	Mar
" <i>Baneriana</i>	..	Shauer	Blue Box	..	T.	Nov
" <i>Behriana</i>	..	F.v.M.	Behr's Gum-tree	..	T.	Nov
" <i>botryoides</i>	..	Smith	Australian Mahogany-tree	..	T.	Feb
" <i>capitellata</i>	..	Smith	White or Coast Stringybark	..	T.	Feb
" <i>corymbosa</i>	..	Smith	Blood-wood Gum or "Boonah"	..	T.	Dec
" <i>corynocalyx</i>	..	F.v.M.	Sugar Gum	..	T.	Feb
" <i>dumosa</i>	..	A. Cunn.	Mallee Scrub Gum or "Bunurduk"	..	T.	June
" <i>elaephora</i>	..	F.v.M.	Spurious Box-tree or "Bundy"	..	T.	Mar, Apl
" <i>eugenioides</i>	..	Sieber	Broad-leaved Stringybark	..	T.	April

<i>Eucalyptus globulus</i>	..	Labill.	Blue Gum or "Ballook"	..	T.	Aug, Sep
" <i>goniocalyx</i>	..	F.v.M.	Victorian Spotted Gum	..	T.	April
" <i>Gunnii</i>	..	Hook.f.	Swamp Gum	..	T.	May, Jun
" <i>hamastoma</i>	..	Smith	White Gum or "Kurra-gurra"	..	T.	Dec-Mar
" <i>hemiphloia</i>	..	F.v.M.	Common Box	..	T.	Mar
" <i>leucoxydon</i>	..	F.v.M.	Scribbly Blue Gum or "Yerrick"	..	T.	Mar, Apl
" <i>„ v. macrocarpa</i>	—		Large-fruited Scribbly Blue Gum	T.	July	
" <i>longifolia</i>	..	Link.	Woollybutt or "Gnaoulie"	..	T.	May-Jly
" <i>macrorrhyncha</i>	F.v.M.		Stringybark or "Yangoora"	..	T.	Jan
" <i>Maideni</i>	..	F.v.M.	Maiden's Gum	..	T.	—
" <i>melliodora</i>	..	Cunn.	Yellow Box or "Dargan"	..	T.	Nov
" <i>Muelleriana</i>	..	Howitt	Yellow or Pale Stringybark	..	T.	May
" <i>obliqua</i>	..	L'Her.	Messmate	..	T.	May
" <i>paniculata</i>	..	Smith	Grey Ironbark	..	T.	Jan
" <i>pilularis</i>	..	Smith	Great Blackbutt or "Benaroon"	T.	Jan	
" <i>polyanthemus</i>	Shauer		Red Box	..	T.	Nov
" <i>pulverulenta</i>	Sims		Silver-leaved Stringybark	..	T.	Nov
" <i>rostrata</i>	..	Schl.	Red Gum or "Yarrah"	..	T.	Dec
" <i>rubida</i>	..	D. & M.	Candle Bark Gum	..	T.	Feb-Apl
" <i>santalifolia</i>	..	F.v.M.	Santalum-leaved Gum	..	T.	Oet
" <i>Sideroxylon</i>	..	A. Cunn.	Victorian Ironbark or "Mugga"	T.	May	
" <i>„ var. rosea</i>	—		Pink-flowered Ironbark	..	T.	May
" <i>Sieberiana</i>	..	F.v.M.	Mountain Ash of Gippsland	..	T.	Oet, Nov
" <i>Stuartiana</i>	..	F.v.M.	Apple-scented Gum	..	T.	Feb
" <i>tereticornis</i>	..	Smith	Forest Red Gum or "Mungarra"	T.	Nov	
" <i>uncinata</i>	..	Turez.	Black Box or "Gunamalary"	..	T.	May
" <i>viminalis</i>	..	Labill.	Manna Gum	..	T.	Mar, Apl
<i>Eueryphia Moorei</i>	..	F.v.M.	Moore's Eueryphia	..	T.S.	—
<i>Eugenia Smithii</i>	..	Poiet	Lilly Pillies or "Coochin Coochin"	T.	Dec	
<i>Eupomatia laurina</i>	..	R. Br.	Australian Copper Laurel	..	S.	Jan
<i>Eustrephus latifolius</i>	..	R. Br.	Broad-leaved Wombat-berry	..	C.	Dec, Jan
<i>Eutaxia empetrifolia</i>	..	Schl.	Empetrum-leaved Eutaxia	..	S.	Aug, Sep
<i>Exocarpus cupressiformis</i>	..	Labill.	Australian Cherry-tree or "Ballee"	T.	Feb, Mar	
<i>Fagus Cunninghami</i>	..	Hook.	Victorian Beech Myrtle	..	T.	Dec
<i>Ficus aspera</i>	..	Forst.	Sandpaper Fig-tree or "Balemo"	T.	—	
<i>Geijera parviflora</i>	..	Lindl.	"Wilga" or Sheep-bush	..	T.S.	—
<i>Geitonoplesium cymosum</i>	..	Cunn.	Australian Shepherd's Joy	..	C.	Nov
<i>Gleichenia circinata</i>	..	Swartz	Climbing Net or Coral Fern	..	F.	—
" <i>dicarpa</i>	..	R. Br.	Alpine Net or Coral Fern	..	F.	—
" <i>flabellata</i>	..	R. Br.	Fan-leaved, Star or Umbrella Fern	F.	—	
<i>Goodenia ovata</i>	..	Smith	Native Hop	..	S.S.	Sep-May
<i>Goodia lotifolia</i>	..	Salisb.	Salisbury or Yellow Pea	..	S.	Sep
" <i>medicaginea</i>	..	F.v.M.	Medicago-leaved Goodia	..	S.	Sep
* <i>Grevillea alpina</i>	..	Lindl.	Alpine Grevillea	..	S.S.	Aug, Dec
" <i>„ var. Dallachiana</i>	..		Dallachy's Grevillea	..	S.S.	Sep
" <i>Aquifolium</i>	..	Lindl.	Prickly Grevillea	..	S.	Jly-Mar
* " <i>confertifolia</i>	..	F.v.M.	Crowded-leaved Grevillea	..	S.S.	Sep, Oct
" <i>ericifolia</i>	..	R. Br.	Heath-leaved Grevillea	..	S.S.	Aug, Sep
" <i>ilicifolia</i>	..	R. Br.	Holly-leaved Grevillea	..	S.	Sep-Jan
" <i>lavandulacea</i>	..	Schl.	Lavender-like Grevillea	..	S.S.	Aug, Sep
" <i>oleoides</i>	..	Sieber	Olive-leaved Grevillea	..	S.	Dec-Apl
* " <i>„ v. dimorpha</i>	—		Crimson-flowered Grevillea	..	S.	Dec-Apl
" <i>parviflora</i>	..	R. Br.	Small-flowered Grevillea	..	S.S.	Oet, Nov
" <i>Victoriæ</i>	..	F.v.M.	Wax-flowered Grevillea	..	S.	Sep
<i>Hakea acicularis</i>	..	R. Br.	Needle-leaved Hakea	..	S.	Jly, Aug

<i>Hakea dactyloides</i>	.. Cav.	Fingered Hakea	.. ..	.. S.	Nov
„ <i>eriantha</i>	.. R. Br.	Woolly-flowered Hakea	.. ..	.. S.	Sep
„ <i>leucoptera</i>	.. R. Br.	Pin-bush or Water Hakea	.. ..	.. S.	Dec, Jan
„ <i>microcarpa</i>	.. R. Br.	Small-fruited Hakea	.. ..	.. S.	Oct
„ <i>nodosa</i>	.. R. Br.	Knotted Hakea	.. ..	.. S.	May, Jun
„ <i>pugioniformis</i>	.. Cav.	Dagger-fruited Hakea	.. ..	.. S.	Dec, Jan
„ <i>rostrata</i>	.. F.v.M.	Bird's-beak Hakea	.. ..	.. S.	Sep
„ <i>rugosa</i>	.. R. Br.	Wrinkled-fruited Hakea	.. ..	.. S.	Sep
„ <i>saligna</i>	.. R. Br.	Willow-leaved Hakea	.. ..	.. T.S.	Sep
„ <i>ulicina</i>	.. R. Br.	Australian Furze	.. ..	.. S.	Sep, Oct
<i>Hardenbergia monophylla</i>	Vent.	Climbing Lilac or Victorian Sarsaparilla	.. ..	.. C.	Aug, Sep
„ „ <i>v. alba</i>		White-flowered Victorian Sarsaparilla	.. ..	.. C.	Aug
<i>Hedycarya angustifolia</i>	.. Tulas.	Australian Mulberry	.. ..	.. T.S.	Sep
<i>Helichrysum ferrugineum</i>	Lessing	Rusty Helichrysum	.. ..	.. S.	Jan
<i>Hemarthria compressa</i>	.. R. Br.	Sugar or Mat Grass	.. ..	.. G.	Nov-Jun
<i>Hibbertia dentata</i>	.. R. Br.	Tooth-leaved Button Flower	.. ..	.. S.S.	Sep, Oct
„ <i>striata</i>	.. R. Br.	Erect Button Flower	.. ..	.. S.S.	Sep
<i>Homalanthus Leschenaultianus</i>	.. Jussieu	Australian Poplar	.. ..	.. S.	Jan
<i>Hovea heterophylla</i>	.. Cunn.	Purple Pea-bush	.. ..	.. S.S.	Aug-Oct
<i>Hymenanthera dentata</i>	.. R. Br.	Tooth-leaved Scrub Boxwood	.. ..	.. T.S.	Sep, Oct
<i>Humea elegans</i>	.. Smith	Plume Plant	.. ..	.. S.	Jan, Feb
<i>Indigofera australis</i>	.. Willd.	Australian Purple Indigo Plant	.. ..	.. S.	Sep
<i>Isopogon anemonifolius</i>	.. R. Br.	Auemone-leaved Cone-bush	.. ..	.. S.	Oct
„ <i>ceratophyllus</i>	.. R. Br.	Buck's-horn-leaved Cone-bush	.. ..	.. S.	Sep, Oct
<i>Juncus communis</i>	.. E. Mey.	Common or Candle Rush or “Wirree”	.. ..	.. R.	Feb
„ <i>maritimus</i>	.. Lam.	Coast Rush	.. ..	.. R.	Feb
<i>Kennedya prostrata</i>	.. R. Br.	Australian Searlet Runner	.. ..	.. T.P.	Sep
„ <i>rubicunda</i>	.. Vent.	Red-flowered Bean Climber	.. ..	.. C.	Nov
<i>Kunzea corifolia</i>	.. Reich.	Bottle-green Tea-tree	.. ..	.. T.S.	Nov
„ <i>peduncularis</i>	.. F.v.M.	Mountain Tea-tree or “Burgan”	.. ..	.. T.S.	Nov, Dec
<i>Lasiopetalum Baueri</i>	.. Steetz	Bauer's Woolly Petal	.. ..	.. S.	Sep, Oct
„ <i>dasyphyllum</i>	.. Sieber	Thick-leaved Woolly Petal	.. ..	.. S.	Oct
„ <i>Schulzenii</i>	.. F.v.M.	Schulz's Woolly Petal	.. ..	.. S.	Sep
<i>Lemna minor</i>	.. Linné	Duckweed	.. ..	.. A.P.	—
<i>Lepidosperma longitundinale</i>	Labill.	Long-leaved Sword Rush	.. ..	.. R.	Jan-Mar
<i>Leptospermum flavescens</i>	.. Smith	Yellowish Tea-tree or “Tantoon”	.. ..	.. T.S.	Jan
„ <i>levigatum</i>	.. F.v.M.	Coast Tea-tree	.. ..	.. T.S.	Sep, Oct
„ <i>lanigerum</i>	.. Smith	River Bank or Woolly Tea-tree	.. ..	.. T.S.	Oct, Nov
* „ „ <i>v. grandiflorum</i>		Large-flowered Woolly Tea-tree	.. ..	.. T.S.	Nov
„ „ <i>myrsinoides</i>	.. Sehl.	Myrsine-like Tea-tree	.. ..	.. S.	Dec
„ „ <i>scoparium</i>	.. R. & G. Forst.	Broom Tea-tree	.. ..	.. S.	Dec
<i>Leucopogon australis</i>	.. F.v.M.	Pigeon-bush	.. ..	.. S.	Jun-Dec
„ <i>ericoides</i>	.. R. Br.	Beard Heath	.. ..	.. S.	Oct
„ <i>lanceolatus</i>	.. Smith	Lance-leaved Pigeon-bush	.. ..	.. S.	Sep
„ <i>Richei</i>	.. Labill.	Carrot-wood	.. ..	.. S.	Oct
„ <i>virgatus</i>	.. Labill.	Twiggy Beard Heath	.. ..	.. S.S.	Sep
<i>Lhotzkya genetylloides</i>	.. F.v.M.	Australian Snow Myrtle	.. ..	.. S.	Aug, Sep
<i>Libertia paniculatum</i>	.. Spreng.	Panicle-flowered Libertia	.. ..	.. D.P.	Oct
<i>Limnanthemum erenatum</i>	.. F.v.M.	Crenate-leaved Marsh Weed	.. ..	.. A.P.	Dec

<i>Lindsaya trichomanoides</i>	..	Dryan.	Trichomanes-like <i>Lindsaya</i>	..	F.	—
<i>Livistona australis</i>	..	Mart.	Australian Cabbage Palm	or		
			"Kondo"	..	..	Palm Oct
<i>Logania floribunda</i>	..	R. Br.	Many-flowered <i>Logania</i>	..	..	S. Aug
<i>Lomaria alpina</i>	..	Spreng.	Alpine <i>Lomaria</i>	..	..	F. —
,, <i>discolor</i>	..	Willd.	Fish-bone Fern	..	..	F. —
,, <i>Patersoni</i>	..	Spreng.	Paterson's <i>Lomaria</i>	..	..	F. —
,, <i>procera</i>	..	Spreng.	Tall or Water Fern	..	..	F. —
<i>Lomatia Fraseri</i>	..	R. Br.	Fraser's Australian Holly	..	..	S. Jan
,, <i>ilicifolia</i>	..	R. Br.	Australian Holly	..	..	S. Dec
,, <i>longifolia</i>	..	R. Br.	Long-leaved Australian Holly	..	..	T.S. Dec
<i>Loranthus celastroides</i>	..	Sieber	Celastrus-like Mistletoe	..	..	Parasite Aug
<i>Lyonsia straminea</i>	..	R. Br.	Australian Silk Pod	..	..	C. Nov, Dec
<i>Lythrum Salicaria</i>	..	Lim.	Purple Willow Herb	..	..	D.P. Jan
<i>Marianthus bignoniaceus</i>	..	F.v.M.	Bignonia-like <i>Marianthus</i>	..	..	C. Oct
<i>Melaleuca acuminata</i>	..	F.v.M.	Pointed-leaved Tea-tree	..	..	T.S. Jan
,, <i>armillaris</i>	..	Smith	Bracelet Tea-tree	..	..	T.S. Nov, Dec
,, <i>decussata</i>	..	R. Br.	Intersected-leaved Tea-tree	..	..	T.S. Nov
,, <i>ericifolia</i>	..	Smith	Swamp Tea-tree	..	..	T.S. Oct, Nov
,, <i>gibbosa</i>	..	Labill.	Swollen-leaved Tea-tree	..	..	S. Nov
,, <i>hypericifolia</i>	..	Smith	Hilloek-tree	..	..	T.S. Feb
,, <i>Preissiana</i>	..	F.v.M.	Small-flowered Tea-tree	..	..	T.S. Feb
,, <i>squarrosa</i>	..	Labill.	Victorian Yellow-wood or Yellow			
			Bottle Brush	..	..	T.S. Oct, Nov
<i>Mentha gracilis</i>	..	R. Br.	Australian Slender Mint	..	..	D.P. Dec-Mar
<i>Mesembryanthemum æqui-</i>						
<i>laterale</i>	Haw.		Australian Noon Flower	..	..	T.P. Oct
* <i>M. æquilaterale</i> , v. <i>album</i>	—		White Australian Noon Flower	..	..	T.P. Oct
*, <i>tegens</i>	..	F.v.M.	Clothing Noon Flower	..	..	T.P. Oct
<i>Micranthemum hexandrum</i>	..	Hook.f.	Australian Box-bush	..	..	S. Sep, Oct
<i>Morinda jasminoides</i>	..	A. Cunn.	Jasmine-like <i>Morinda</i>	..	..	S. Sep
<i>Muehlenbeckia adpressa</i>	..	Meiss.	Australian Ivy	..	..	C. Dec, Jan
,, <i>Cunninghami</i>	..	F.v.M.	Cunningham's Rock Vine	..	..	S. May
<i>Myoporum acuminatum</i> ,						
v. <i>angustifolium</i>	—		"Boobiala" or Water-bush	..	..	T.S. Apl-July
,, <i>deserti</i>	..	Cunn.	Sweet-fruited <i>Myoporum</i>	or		
			Turkey-bush	..	..	T.S. Mar, Jly
,, <i>humile</i>	..	R. Br.	Trailing <i>Myoporum</i>	..	..	T.P. Jan
,, <i>serratum</i>	..	R. Br.	Cockatoo-bush	..	..	S. Oct
,, <i>viscosum</i>	..	R. Br.	Sticky <i>Myoporum</i>	..	..	T.S. Aug
<i>Myosotis australis</i>	..	R. Br.	Australian Forget-me-not	..	..	D.P. Dec
<i>Myrsine variabilis</i>	..	R. Br.	Victorian Smooth Beech	..	..	T.S. Dec, Jan
<i>Nasturtium palustre</i>	..	D. C.	Marsh Watercress	..	..	A. Jan
<i>Nephelium leiocarpum</i>	..	F.v.M.	Smooth-fruited <i>Nephelium</i>	..	..	T. Nov
<i>Nicotiana suaveolens</i>	..	Lehm.	Australian Tobacco Plant	..	..	S.P. Nov, Feb
<i>Notelaea ligustrina</i>	..	Vent.	White Plum-wood of Gippsland	..	..	T.S. Nov, Dec
,, <i>longifolia</i>	..	Vent.	Gippsland Mock Olive	..	..	T.S. Nov, Dec
<i>Olearia argophylla</i>	..	Labill.	Australian Musk-tree or "Daal"	T.S.		Oct, Nov
,, <i>axillaris</i>	..	F.v.M.	Axil-flowered Daisy-bush	..	..	S. March
,, <i>glandulosa</i>	..	Labill.	Swamp Aster	..	..	S. Feb, Mar
,, <i>myrsinoides</i>	..	Labill.	Myrsine-like Daisy-bush	..	..	S. Sep
,, <i>var. erubescens</i>			Blush-flowered Daisy-bush	..	..	S.S. Dec
,, <i>pannosa</i>	..	F.v.M.	Wrinkled Daisy-bush	..	..	S. Aug
,, <i>ramulosa</i>	..	Labill.	Twiggy Daisy-bush	..	..	S. Jan-Apr
,, <i>stellulata</i>	..	Labill.	Victorian Snow-bush	..	..	S. Sep, Oct

<i>Olearia stellulata</i> , var. <i>lirata</i>	—	Ridge Snow-bush	S.	Aug, Sep
<i>Oxylobium ellipticum</i>	.. R. Br.	Oval-leaved Pointed Pod-bush ..	S.	Nov
<i>Panax sambucifolia</i>	.. Sieber	Victorian Elderberry Ash ..	T.S.	Dec
<i>Patersonia glauca</i>	.. R. Br.	Australian Swamp Flag ..	S.P.	Nov, Dec
<i>longiscapa</i>	.. Sweet	Long-scaped Australian Flag ..	S.P.	Nov, Dec
<i>sericea</i>	.. R. Br.	Silky Australian Flag ..	S.P.	—
<i>Pelargonium Rodneyanum</i>	Mitch.	Rodney's Stork-bill ..	D.P.	Jan, Feb
<i>Persoonia linearis</i>	.. Andr.	Narrow-leaved Persoonia or "Gee- bung"	S.	Jan
<i>myrtilloides</i>	.. Sieber	Myrtillus-like Persoonia ..	S.	Jan
<i>Phebalium dentatum</i>	.. Smith	Tooth-leaved Mountain Myrtle ..	S.	Sep
<i>Pholidia divaricata</i>	.. F.v.M.	Straggling Pholidia ..	S.	Jan
<i>Phyllanthus thymoides</i>	.. Sieber	Thyme-like Phyllanthus ..	S.	Oct
<i>Pimelea flava</i>	.. R. Br.	Yellow Rice Flower ..	S.S.	Sep
<i>humilis</i>	.. R. Br.	Dwarf Rice Flower ..	S.S.	Oct
<i>Pittosporum bicolor</i>	.. Hook.	Victorian Cheesewood or White- wood	T.	Oct
<i>phillyræoides</i>	D. C.	Australian Willow ..	T.S.	Oct
<i>revolutum</i>	.. Aiton	Yellow-flowered Brisbane Laurel	S.	Sep, Oct
<i>undulatum</i>	.. Vent.	Victorian Laurel ..	T.S.	Sep, Oct
<i>Plagianthus pulchellus</i>	.. A. Gray	Victorian Hemp-bush ..	T.S.	Sep, Oct
<i>v. tomentosus</i>	..	Woolly Hemp-bush ..	T.S.	Sep, Oct
<i>Platylobium formosum</i>	.. Smith	Beautiful Flat Pea ..	S.S.	Aug, Sep
<i>obtusangulum</i>	.. Hook.	Victorian Flat Pea ..	S.S.	Sep, Oct
<i>Plectranthus parviflorus</i>	Henck.	Small Cockspur Flower ..	D.P.	Dec, Jan
<i>Poa caespitosa</i>	.. G. Fors.	Australian Meadow Grass ..	G.	Nov-Jan
<i>Polypodium australe</i>	.. Metten.	Finger or Tuft Fern ..	F.	—
<i>Billardieri</i>	.. R. Br.	Blistered Polypody ..	F.	—
<i>punctatum</i>	.. Thun.	Rough Polypody ..	F.	—
<i>Pomaderris apetalá</i>	.. Labill.	Victorian Wild Hazel ..	T.S.	Sep, Oct
<i>lanigera</i>	.. Sims	New South Wales Wild Hazel ..	S.	Aug, Sep
<i>ligustrina</i>	.. Sieber	Privet-like Wild Hazel ..	S.	Oct
<i>phylicifolia</i>	.. Lodd.	"Tauhinu" ..	S.	—
<i>prunifolia</i>	.. A. Cunn.	Plum-leaved Wild Hazel ..	S.	Oct
<i>racemosa</i>	.. Hook.	Raceme-flowered Wild Hazel ..	S.	Oct, Nov
<i>vacciniifolia</i>	Reiss.	Vaccinium-leaved Wild Hazel ..	S.	March
<i>Potamogeton crispus</i>	.. Linné	Curled-leaved Pond-weed ..	A.P.	Dec
<i>Prostanthera lasianthos</i>	.. Labill.	Victorian Christmas-bush ..	S.	Dec, Jan
* <i>melissifolia</i>	F.v.M.	Balm-leaved Mint-bush ..	S.	Oct
<i>microphylla</i>	A. Cunn.	Scarlet-flowered Mint-bush ..	S.	Nov
<i>nivea</i>	.. A. Cunn.	Snowy Mint-bush ..	S.	Sep, Oct
<i>phylicifolia</i>	F.v.M.	Phylla-leaved Mint-bush ..	S.S.	Oct
<i>rotundifolia</i>	R. Br.	Round-leaved Mint-bush ..	S.	Sep
<i>spinosa</i>	.. F.v.M.	Prickly Mint-bush ..	S.	Nov, Dec
<i>Walteri</i>	.. F.v.M.	Walter's Mint-bush ..	S.	Nov, Dec
<i>Pteris aquilina</i>	.. Linné	Common Brake or Bracken Fern	F.	—
<i>comans</i>	.. G. Fors.	Hairy Bracken Fern ..	F.	—
<i>falcata</i>	.. R. Br.	Sickle-shaped Bracken Fern ..	F.	—
<i>tremula</i>	.. R. Br.	Trembling Bracken Fern ..	F.	—
<i>umbrosa</i>	.. R. Br.	Shady Bracken ..	F.	—
<i>Pultenæa daphnoides</i>	.. Wendl.	Australian Wallflower-bush ..	S.	Sep
<i>Gunnii</i>	.. Benth.	Golden Bush-Pea ..	S.	Sep
<i>Muelleri</i>	.. Benth.	Mueller's Pultenæa ..	S.	Sep
<i>retusa</i>	.. Smith	Blunt-leaved Pultenæa ..	S.	Sep
<i>scabra</i>	.. R. Br.	Australian Scar-bush ..	S.	Sep, Oct

<i>Pultenæa stricta</i> ..	..	Sims	Erect <i>Pultenæa</i> ..	..	..	S.	Sep. Oct
„ <i>villosa</i> ..	..	Willd.	Hairy Bush-Pea ..	..	..	S.	Sep
<i>Ranunculus lappaceus</i> ..	..	Smith	Australian Buttercup ..	..	..	D.P.	Jun-Oct
<i>Restio tetraphyllus</i> ..	..	Labill.	Four-leaved Cord-Grass ..	..	..	R.	Dec-Mar
<i>Rhagodia Billardieri</i> ..	..	R. Br.	Labillardiere's Red Berry ..	..	..	S.	Dec-May
<i>Ricinocarpus pinifolius</i> ..	..	Desf.	Australian Jasmine-bush ..	..	..	S.	Oct-Nov
<i>Rubus parvifolius</i> ..	..	Linné	Australian Bramble or Wild Rasp- berry ..	..	..	S.	Nov-Dec
„ <i>rosæfolius</i> ..	..	Smith	Victorian Raspberry or “Neram” ..	..	..	S.	Oct-Nov
<i>Sarcopetalum Harveyanum</i> ..	..	F.v.M.	Harvey's Vine ..	..	..	C.	March
<i>Sarcostemma anstrale</i> ..	..	R. Br.	Caustic Vine ..	..	..	C.	—
<i>Scævola suaveolens</i> ..	..	R. Br.	Sweet-scented <i>Scævola</i> ..	..	..	T.P.	Jan-May
<i>Scirpus nodosus</i> ..	..	Roth.	Knotted Club Rush or “Wiwi” ..	..	..	R.	Nov-Mar
<i>Senecio australis</i> ..	..	A. Rich.	Australian Groundsel or Fire Weed ..	..	..	S.P.	Feb
<i>Smilax australis</i> ..	..	R. Br.	Australian Sarsaparilla ..	..	..	C.	May
<i>Solanum aviculare</i> ..	..	G. Forst.	Kangaroo Apple ..	..	..	S.	Nov, Dec
<i>Spyridium parvifolium</i> ..	..	F.v.M.	Silver Hazel-bush ..	..	..	S.	Aug. Sep
<i>Sterculia diversifolia</i> ..	..	G. Don	Victorian Bottle-tree ..	..	..	T.	Jan. Feb
<i>Stipa elegantissima</i> ..	..	Labill.	Elegant Feather Grass ..	..	..	G.	Nov-Jan
<i>Stypandra cæspitosa</i> ..	..	R. Br.	Tufted <i>Stypandra</i> ..	..	..	D.P.	Nov-Feb
„ <i>glauca</i> ..	..	R. Br.	Candyup Poison or Blind Grass ..	..	..	D.P.	Oct
<i>Swainsona Greyana</i> ..	..	Lindl.	Darling River or Poison Pea ..	..	..	S.S.	Dec, Jan
<i>Tecoma australis</i> ..	..	R. Br.	Wonga Wonga Vine ..	..	..	C.	Sep, Oct
„ „ <i>var. Latrobei</i> ..	..	—	Governor Latrobe's <i>Tecoma</i> ..	..	..	C.	Oct
<i>Telopea oreades</i> ..	..	F.v.M.	Victorian Waratah ..	..	..	S.	Oct
<i>Tetragonia implexicoma</i> ..	..	Hook.f.	Victorian Bower Spinach ..	..	..	T.P.	May-Oct
<i>Tetratheca ciliata</i> ..	..	Lindl.	Pink Glory-bush ..	..	..	S.S.	Sep, Oct
„ <i>pilosa</i> ..	..	Labill.	Hairy <i>Tetratheca</i> ..	..	..	S.S.	Oct
<i>Teucrium racemosum</i> ..	..	R. Br.	Racemed Germander ..	..	..	D.P.	March
<i>Thryptomene Mitchelliana</i> ..	..	F.v.M.	Heath Myrtle ..	..	..	S.	Aug, Sep
<i>Todea barbara</i> ..	..	Moore	King Fern ..	..	..	F.	—
<i>Tristania laurina</i> ..	..	R. Br.	Swamp Mahogany or Kanooka ..	..	..	T.	Jan, Feb
<i>Typha angustifolia</i> ..	..	Linné	Native Bulrush or Cat's Tail ..	..	..	A.P.	Nov-Mar
<i>Verbena officinalis</i> ..	..	Linné	Vervain ..	..	..	D.P.	Dec-Mar
<i>Veronica Derwentia</i> ..	..	Littlej.	Derwent's Speedwell ..	..	..	S.	Jan, Feb
„ <i>gracilis</i> ..	..	R. Br.	Slender Speedwell ..	..	..	D.P.	Nov-Jan
„ <i>perfoliata</i> ..	..	R. Br.	Digger's Speedwell ..	..	..	S.	Oct
<i>Villarsia reniformis</i> ..	..	R. Br.	Kidney-leaved March Buttercup ..	..	..	D.P.	Sep-Dec
<i>Viminaria denudata</i> ..	..	Smith	Golden Spray ..	..	..	S.	Dec
<i>Viola hederacea</i> ..	..	Labill.	Ivy-leaved or Wild Violet ..	..	..	T.P.	Apl-Dec
<i>Vitis antarctica</i> ..	..	Benth.	Kangaroo Grape ..	..	..	C.	Oct, Nov
„ <i>hypoglauca</i> ..	..	F.v.M.	Gippsland Grape ..	..	..	C.	Oct, Nov
<i>Westringia glabra</i> ..	..	R. Br.	Smooth-leaved Australian Rose- mary-bush ..	..	..	S.	Oct
„ <i>rosmariniformis</i> ..	..	Smith	Australian Rosemary ..	..	..	S.	Sep
„ <i>rigida</i> ..	..	R. Br.	Stiff Australian Rosemary-bush ..	..	..	S.	Oct
<i>Xanthorrhœa australis</i> ..	..	R. Br.	Victorian Grass-tree ..	..	..	—	Nov
„ <i>hastilis</i> ..	..	R. Br.	Australian Grass-tree ..	..	..	—	Nov
„ <i>minor</i> ..	..	R. Br.	Dwarf Grass-tree ..	..	..	—	Nov
<i>Xerotes filiformis</i> ..	..	R. Br.	Thread-shaped Mat Rush ..	..	..	R.	Oct-Dec
„ <i>longifolia</i> ..	..	R. Br.	Australian Tussock Grass or Mat Rush ..	..	..	R.	Oct-Dec
<i>Zieria Smithii</i> ..	..	Andr.	Sandfly-bush ..	..	..	S.	Sep

RECORDS OF THE WESTERN AUSTRALIAN MUSEUM AND ART GALLERY.—The first part of this recent addition to the scientific serials of Australia is devoted to an article on "The Fossil Marsupials of Western Australia," by Mr. Bernard H. Woodward, F.G.S., Director of the Museum. The remains of the species described—*Tachyglossus aculeatus*, Native Porcupine; *Phascolomys hacketti*, sp. nov., Wombat; *Phascolarctus cinereus*, Koala or Native Bear; and *Sthenurus occidentalis*, sp. nov., a kangaroo—were obtained in the Mammoth Cave, in the south-western portion of the State. Mr. L. Glauert, F.G.S., who devoted some two months to the exploration of this cave, and collected about 2,000 specimens, adds some notes on the features of the cave and the occurrence of the bones. A plate of the entrance to the cave, and seven figures, each on a separate plate, of the different specimens, each with included scale of measurements, make up a very interesting and creditable publication.

THE A.N.A. EXHIBITION.—Natural history was represented to some extent at the recent A.N.A. Exhibition, and was evidently appreciated, for we regret to learn from the Government Entomologist that on examining the cabinet drawers of life-histories, &c., on their return to his office he was greatly annoyed to find that the drawers had been robbed of some of their most valuable contents. Some of the specimens were unique, and will be hard to replace. Seeing that Mr. French has always been so ready to afford information and show the specimens to inquirers, this is very poor reward for his trouble, and will lead to entomological specimens being excluded from the departmental exhibits at future exhibitions.

THE LOTUS LILY.—Plants of the famous Lotus Lily, *Nelumbium speciosum*, have recently been grown and flowered for the first time in the Melbourne Botanic Gardens. The plants possess beautiful peltate leaves, from one to two feet in diameter, rising in numerous instances above the water surface on erect petioles of varying heights up to twenty-four inches. The flowers, which are of a delicate pink colour, nearly twelve inches across, are borne singly on stalks which stand out above the water for two or three feet. The plant is variously known as the "Sacred Lotus," "Egyptian Bean of Pythagoras," "Leichardt's Water Lily," "Pink Water Lily," "Sacred Lily of Buddha." Although the plant grows luxuriantly in the Adelaide, Brisbane, and Sydney Botanic Gardens, a difficulty had previously been found in transporting it safely to Melbourne, owing to the liability of its rhizomes to rot in transit. However, by arrangement with Dr. A. Holtze, Director of the Adelaide Gardens, a clump of the plant, while in a dormant state, was lifted one morning in August last, and forwarded by express train the same day. The package received attention here the next morning, and although some of the rhizomes had rotted the remainder were successfully developed.—F. PITCHER.

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FIELD NATURALISTS' CLUB OF VICTORIA.

THE ordinary monthly meeting of the Club was held at the Royal Society's Hall on Monday evening, 14th March, 1910.

The president, Prof. A. J. Ewart, D.Sc., occupied the chair, and about 80 members and visitors were present.

VISIT OF MICROSCOPICAL SOCIETY.

The Chairman said that the Committee of the Club had invited the members of the Microscopical Society of Victoria to be present that evening, and take part in the usual conversazione. He therefore took the opportunity of extending a hearty welcome to the members, and pointed out the necessity of co-operation between scientific societies, advocating closer touch and sympathy, lest a drifting apart might tend to weaken their influence.

Dr. J. C. Kaufmann, President of the Microscopical Society, thanked the Club for its invitation, and trusted there would be a long continuance of friendship between the societies.

REPORTS.

A report of the visit to the Zoological Gardens on Saturday, 19th February, was forwarded by the leader, Mr. D. Le Souëf, C.M.Z.S., director of the gardens, who reported that the day turned out extremely hot, consequently the attendance was small. However, a number of interesting animals and birds were inspected. The nesting mound of the Scrub Turkey, *Catheturus lathamii*, was examined, and its temperature found to be about 98°. Several young birds recently hatched were seen. An adjoining enclosure contained several Mallee Hens, *Lipoa ocellata*, Gld., but they do not breed in captivity. Several Plumed Egrets, *Mesophoyx plumifera*, Gld., have recently been added, and their spotless plumage was very attractive. Some clutches of Brown and Stubble Quail were on view. An inspection of the large flight aviary showed that numbers of Honey-eaters, Wood-Swallows, Yellow-breasted Robins, Magpie Larks, &c., lived together in perfect harmony. Many recent additions from foreign countries were seen, and a little time was spent in inspecting the Brown and Loch Leven Trout in the hatching ponds.

A report of the excursion to Alexandra-avenue and South Yarra on Saturday, 26th February, was given by the leader, Mr. F. Chapman, A.L.S., who reported a good attendance. Attention was called to the geological features of the lower Yarra, then the localities of certain fossils were pointed out, and some attention paid to the large igneous dyke exposed in the cutting near the

Botanic Gardens, but which is unfortunately being rapidly covered by ornamental vegetation. Further along to the east of Anderson-street the position of another much-decomposed dyke was pointed out, and several interesting fossils were obtained by examination of the material used for forming the new roadway.

A report of the excursion to Beaumaris on Saturday, 12th March, was given by the leader, Mr. O. A. Sayce, A.L.S., who reported a good attendance, but the work was somewhat hampered by the unfavourable tide. However, comparisons were made between high and low-tide life, while marine and fresh-water forms were compared with land forms.

A report of the junior excursion to Beaumaris on Saturday, 5th March, was given by the leader, Mr. R. W. Armitage, who reported an attendance of about fifty juniors, and that an interesting afternoon had been spent.

ELECTION.

On a ballot being taken, Mr. E. A. Petherick, F.R.G.S., Melbourne, was duly elected a member of the Club.

PAPER READ.

By Mr. F. Chapman, A.L.S., entitled "Victorian Foraminifera : Recent and Fossil."

The author pointed out that there are still many problems regarding Foraminifera which require working out, questions which can be answered both by the study of living and fossil forms. He called attention to the richness of the Victorian Tertiary deposits, which compared favorably with the better known ones of Spain, Italy, and the West Indies. He gave a number of useful hints on the collection of recent and fossil species, with methods of cleaning and mounting for the microscope, and illustrated his remarks with a fine series of lantern slides and later by mounted specimens under the microscope.

NATURAL HISTORY NOTE.

"APPLE-NUTS."—Mr. D. McAlpine forwarded a note on the so-called "apple-nuts" or "fossil apples," which were recorded in the *Naturalist* of May, 1906 (vol. xxiii., p. 4), as having been found in coal cargoes at various times. These he had, by inquiry, found to be the seeds of a sago-yielding palm, *Metroxylon amicarum*, Hook. f., indigenous to the Solomon Islands, from whence they had been sent to Sydney as articles of commerce, and becoming loose in the steamers had become mixed with subsequent coal cargoes.

EXHIBITS.

The following were the principal exhibits :—

By Mr. C. French, F.L.S.—Male and female of a remarkable beetle, taken in ants' nests, Mulgrave River, Queensland, by Mr. J. Hacker. Its determination by Mr. A. M. Lea, Government Entomologist of Tasmania, had required the establishment of a

new family and genus, and it will be known to science as *Tretothorax cleistotoma* (Tretothoracidae), Lea. The new family will come between the Brenthidae and the Colydiidae.

By Mr. C. French, jun.—Examples of an Algal mass, of a species not yet determined, occurring in large patches over many acres of damp ground in the Werribee district. Mr. A. D. Hardy, F.L.S., called attention to the exhibit, and ventured the opinion that it was probably a species of *Vaucheria*, but it would require microscopical examination, and then only if in fruiting condition, to determine the precise species.

By Mr. D. McAlpine.—Nuts of Palm, *Metroxylon amicarum*, Hooker f., from Solomon Islands, known in commerce as "apple-nuts," in illustration of note.

By Mr. J. G. O'Donoghue.—Fine flowering specimens of *Eucalyptus regnans*, from Sassafras.

MICROSCOPICAL EXHIBITS.

By Mr. R. W. Armitage†.—Microscopic sections of (a) junction of basalt, with included fossil charred wood, from Clifton Hill quarry; (b) basalt from same quarry; (c) dense basalt from plug or throat of Mount Bland, Beveridge, showing flow structure.

By Mr. F. Chapman, A.L.S.†—Forty-one lantern slides in illustration of paper. Forms of microscope slides used in mounting Foraminifera. Foraminiferal shell-sand from Shoreham, Western Port. Foraminiferal dredgings from Point Cook, Port Phillip Bay. Mounted slides of recent Foraminifera from Hobson's Bay, St. Kilda, and Torquay. Foraminiferal clay from the Altona Bay coal shaft. Foraminiferal limestone from Batesford, near Geelong. Fossiliferous sands, with Foraminifera, from Beaumaris, Grice's Creek (Frankston), and Torquay.

By Mr. A. D. Hardy, F.L.S.†—Three types of pollen grains, from *Cobea scandens*, *Epacris impressa*, and *Acacia Baileyana*; also fresh-water Algæ (Desmidiaceæ), *Closterium setaceum*, Ehr., from Whanregarwan, Upper Goulburn; and *Staurostrum leptacanthum*, Nordst., from Yan Yean.

By Mr. J. Searle.†—Marine crustacea and rotifer, *Pedalion mirum*.

By Mr. J. Stickland.†—Rotifers, *Pedalion mirum* and *Megalotrocha albo-flavicans*.

By Mr. J. Wilcox.—Living rotifers.

The following exhibits were made by members of the Microscopical Society of Victoria:—

By Mr. W. G. Bullen.—Botanical and Entomological mounts.

By Mr. E. Creed.—Foraminifera and Polycystina.

By Rev. W. Fielder.*—Sections showing development of chick at various stages.

* Also member of the Field Naturalists' Club.

† Also member of the Microscopical Society.

By Dr. J. C. Kaufmann.*—Spectre shrimps, with parasitic diatoms ; diatoms from Beaumaris.

By Mr. J. Lambie.—Grouped diatoms and vase of butterfly scales.

By Mr. W. J. M'Caw.*—Vegetable fibres under polariscope.

By Mr. S. Seabrook.—Anthrax and other bacteria.

By Mr. J. Twyford.*—Rock sections (granite and basalt) under polariscope.

By Mr. J. Wilson.—Diatoms, Polycystina, &c.

After the usual conversazione the meeting terminated.

EXCURSION TO ALEXANDRA-AVENUE, &c.

NINETEEN members and friends assembled at Prince's Bridge on Saturday afternoon, 26th February, for the purpose of examining the geological features of the lower Yarra and the instructive road-sections exposed on the south side of the river. The weather was all that could be desired, being delightfully fine and cool. Turning to the left from the St. Kilda-road, past the Immigrants' Home, the chief geological features of the locality were pointed out by the aid of a sketch map. The former course of the Yarra towards South Melbourne was remarked upon, as seen in the site of swamps formerly crossing the St. Kilda-road and the present Albert Park Lagoon. The prominent river-cliffs of the South Yarra Silurian were noticed, where they begin to rise in front of the artificially truncated mound on which stands the Queen's statue. Some of the red sands from the capping of the Silurian hills had been excavated and thrown down at the back of the home aforesaid, and there was also a small heap of rubbly Silurian at the same place, probably a remnant of the heaps of *débris* which had already afforded one of our members some choice specimens of the slender *Orthoceras*-like shell, *Protobactrites*, and a *Craniella*. The old pumping station was located, and the quarry at the side, which had in former times yielded quite a rich harvest to a few of our indefatigable collectors. At this place, near the anticline, and, in fact on one of its limbs, were formerly found the handsome star-fish, *Palæaster*, and the trilobite, *Homalonotus*. The type-specimen of a curious little crinoid, *Hapalocrinus victoriæ*, described by Dr. Bather, of the British Museum, also occurred near here, but closer to the river. The type-specimen of *Cyphaspis spanyi*, Mr. F. Spry informed us, was obtained close to the "Temple of the Winds." Before reaching the first gate of the Botanical Gardens we halted at a grassed depression containing a few heaps of Silurian fragments and some blocks of the quartz-felsite dyke which occurs in the road-section just beyond. The dyke is very compact, white, and comparatively fresh. It is one of the widest of the igneous

* Also member of the Field Naturalists' Club.

dykes traversing the Silurian in the vicinity, being 18 feet thick; but is, unfortunately, becoming obscured from view, owing to the growth of ornamental vegetation. Near this second quarry were obtained the fossil fucoids recorded by Blandowski in 1858, and now determined as *Bythotrephis*. Specimens of the dyke-rock were secured, and also a few fossils. Proceeding up the river, beyond Anderson-street, the party reached the site of Hoyte's Paddock, where, strewn on the roadside, were numerous fragments ready for the hammers of the practical students of the party. Whilst the naturalists studied the broken fragments, the natives studied the field naturalists. A fair amount of success rewarded the efforts of the "stonebreakers," and the specimens obtained were *Trachyderma crassituba*, Chapm. MS.; *Camarotoechia decemplicata*, Sow., sp.; *Nucleospira australis*, M'Coy; *Nucula melbournensis*, Ch.; *Nuculites maccoyanus*, Ch.; *Palæoneilo*, sp.; *Hyolithes spryi*, Ch.; *Cycloceras bullatum*, Sow., sp.; *Encrinurus*, sp., and (?) *Ceratiocaris*, sp. (casts of spines and carapace). A search on the bank slope of the river, a short distance beyond the Punt-road footbridge, revealed the presence of a narrow dyke of a much-decomposed igneous basic rock, full of dark biotite-mica crystals. This dyke-rock is of a different nature to the more acid or granite-like dykes usually met with in the Silurian, and, judging from occurrences elsewhere, possibly older than the white felsitic dykes in the Alexandra-avenue. It probably belongs to the ultra-basic lamprophyres, judging from the character of the green decomposition products and the large proportion of biotite. The exposure seen on this occasion may be one of the minor forks of a similar and thicker dyke found in the neighbourhood of Chapel-street. This concluded the business of the afternoon, and the members soon afterwards dispersed, being fully convinced that it is not essential to travel outside the zone of city sounds in order to study and enjoy the problems of the past.—F. CHAPMAN.

EXCURSION TO WEST WARBURTON.

THE Foundation Day excursion (29th to 31st January), originally intended for Gilderoy, in the valley of the Little Yarra, was diverted to West Warburton by common consent of those participating—viz., Messrs. Barnard, Mowling, Sutton, and myself—the reason for the change being that all available accommodation there had been early bespoken. Not wholly as an afterthought, West Warburton claimed our attention as a centre whence the large dacite area on the northern side of the Yarra might be examined from the river to the top of the ridge by traversing the valley of the Dee and cutting across the tributary streamlets and up to "The Rock." This was the principal outing, but the flats along the Yarra, the Silurian country to the east and

west of the township, and the granite which, separating the latter widely to the south, runs out as a narrow tongue to end abruptly near the Yarra, afford a variety not easily obtained from any other centre.

Comfortably housed at Mrs. Ryan's hotel on Saturday, the eye was attracted to the steep mountain slopes on the further side of the river, culminating westerly in the Rock and easterly in Donna-Buang, about 4 miles apart, respectively 3,350 and 4,080 feet above sea-level. At the foot of the steep, the Yarra runs a fast, swirling stream, fringed with a shrubbery mostly myrtaceous, but including the proteaceous *Lomatia longifolia*, &c., and sheltered by these the Native Raspberry, *Rubus parvifolius*, and the introduced Bramble or Blackberry, *R. fruticosus*, both in fruit, helped to make an impenetrable thicket. South of the Yarra the valley, which is very narrow at Warburton proper, widens westerly, and fairly extensive alluvial flats carry appropriate vegetation, inclusive of several species of Eucalypts, the most conspicuous of these being the half-barked form of the Manna Gum, *E. viminalis*; and *E. amygdalina*, of lowland, full-barked habit; with *E. goniocalyx*, Victorian Spotted Gum, of smooth-barked highland form; and *E. gunni*, the Swamp Gum or Cider Eucalypt, which here are good shade trees, owing to the comparative bushiness of their branchlets and the profuseness of the foliage, combined with a somewhat drooping habit of their lower branches.

Previous excursion parties of the Club had examined the valley of the Don, which lies to the west of the Rock (*Vict. Nat.*, xxv., p. 3), and that of the Yithan, which has its origin near Donna-Buang (*Vict. Nat.*, xxii., p. 128). These being of similar aspect, altitude, and geological condition, the character of the floras of the Don and the Dee are, as would be expected, much alike and of typical Gippsland gully character. Crossing the Yarra by a substantial bridge, we found a somewhat steep road, mostly formed by side-cutting, leading up the mountain side. Down below ran the Dee, a foaming, rushing rivulet, so embowered in vegetation as to be scarcely visible. Stately tree-ferns, many very tall, with fine specimens of the King fern, *Osmunda barbara*, took advantage of the cool, sheltered position, and enhanced the scene with their ever graceful fronds. The climbers *Lyonsia* and *Tecoma* entwined the blackwoods, *prostantheras* and *dogwoods*, and at every turn some fresh arrangement of foliage delighted the eye. At length we reached a plateau, where had formerly been a saw-mill, and, getting directions from a resident, started along a disused timber-tram towards the Rock, which we had decided was to be our goal for the day. The first evergreen Beech, *Fagus Cunninghamii*, was encountered at an altitude of 1,000 feet, and to this height the proscribed *Rubus* has gained a footing

along the roadway. The mountain side has been selected and denuded of timber. This belt is about two miles wide. Above it the forest area has also been cleared, partly by legitimate cutting and partly by bush fires. Many years ago the wastefulness of the timber-getter was, in the midst of plenty, and under an old system, hardly observable, but from the standpoint of the system of the last few years, and with timber fast disappearing, the thousands of whitened trunks which lie where they fell, or slid to when cut, caused us to indulge in much useless regret. To-day active watchful foresters traverse the timber lands to check illicit cutting and grazing, and, among much else, even examine the refuse heaps at the mills to see that every available foot of the logs is made use of, hence waste is now almost reduced to its minimum. When climbing about these mountain sides, forcing one's way through almost impenetrable scrub and over huge tree trunks, one realizes far better than from the comfort of an easy chair the area to be covered, the difficulties of travel—often by saddle impracticable—and the comparative fewness of the officers for the purpose.

During our climb through the higher portion of the forest we could not help but remarking the extraordinary length of the strips of bark hanging from the trees. One tall tree had a remarkable appearance. The bark had stripped from the base upwards in a number of thin straps about $\frac{1}{8}$ -inch thick and a few inches wide. One of these straps had been tossed by the wind until the free end had reached an adjacent tall tree, round which it tangled, and thus formed a giant festoon; another had frayed itself into a fine fringe, and several rested with their free ends on the ground. By taking in hand the end of one of these and walking away from the base of the tree we were able to estimate, by means of the angle formed and the measured base, that the bark had increased its original length by about 10 per cent. ! the result of tensile strain of gravity and wind pressure. The length of the strip was about 100 feet.

The upper parts of the tributaries of the Dee run through a fine beech forest, some of the old trees, with bifurcated trunks, having a circumference at the base of over 30 feet. Two kinds of fungus were plentiful on the old bark, one a Polyporus, a dark brown, hard, horizontally laminated "bracket" fungus, and the other, of which we brought away a fine specimen, has been kindly identified by Mr. D. McAlpine, Government Vegetable Pathologist, as *Daldinia concentrica* (Balt.), Cess. and De Nat. Some interest attaches to this specimen, which, Mr. McAlpine states, is the largest he has seen or read of. It was of hard, smooth surface when collected, but in a few days was covered with a sooty-black powder, and this, composed of spores ejected from the asci, had sprinkled the sub-stratum on which the fungus

rested to a radial distance of two inches beyond the margin of the plant, which was about two and a half inches in diameter. On the exposed root of an old beech, some six inches or so above ground, the fractured and empty shell of the black land-snail, *Helix atramentaria*, was found, and near it a Lyre-bird's feather. The association was suggestive of a tragedy in low life. Can any member tell us whether the Lyre-bird has been known to eat these snails after fracturing the shell, as the Thrush does the garden snail? We had not been following the most direct track to the summit, and after leaving the beech forest and its included fern gullies, found ourselves in scrubby country, near the top of the range, which was very difficult to traverse, owing to much of the scrub having been beaten down into a veritable tangle by the winter snow. At length this was passed, and a depression, one of the heads of the Don, draining the other slope of the range, crossed, but only to get into another almost impassable area, covered with shrubby asters and cassinas, which, as we fought our way through, rid themselves of the minute hairlets with which they are clothed, and these latter, getting into our throats and nostrils, set up a most terrible irritation, which was anything but pleasant while it lasted. Eventually we struck a paling-getters' track, from which "The Rock" is easily accessible through a small forest of young blackbutts. This we found to be an exposed boss of dacite, several acres in extent, with a precipitous face turned to the south-east, but less steeply descending towards the north-west. The surface is traversed by small and large fissures, which strike south east, and others obliquely to the north. The fissures occasioned by mechanical stress and change of temperature have become widened and hollowed out in places in the process of weathering; rain, frost, and the chemical action of decomposing vegetable matter and living plants, such as lichens, have paved the way for a growth of pseudo-petrophytes, stunted gums, acacias, calistemon, &c., having secured a good root hold. The rock weathers also by throwing off thin concentric flakes. The summit was not without flowering plants of an herbaceous nature, while in the crevices of the stones grew the little Rat-tailed Fern, *Asplenium flabellifolium*, the highest plant of all being *Geranium pilosum*, but the introduced Flat Weed, *Hypochaeris radicata*, grew close by. The surrounding eucalypts are *E. pillularis*, Blackbutt, *E. gonicalyx*, Victorian Spotted Gum, which succeeds the Messmate, *E. obliqua*, and Manna Gum, *E. viminalis*, &c., of lower altitude.

From "The Rock," in suitable weather, a magnificent view can be obtained, and for this alone the climb is justified. The day was too hazy to make out through our field-glasses any of the prominent land-marks of Melbourne, forty miles away, but the pine trees on the hill at Ringwood were distinctly visible, while Mounts

Macedon and Baw Baw, about a hundred miles apart, bounded our view to the west and east. To the north the sharp cone of Mt. St. Leonard was just visible through the trees. We looked over "Nyora," and Malleson's Look-out to Healesville, but the most delightful view was down into the Yarra valley, nearly three thousand feet below us, where the three townships of West Warburton, Millgrove, and Warburton were prominent features. An apparently level ridge led round eastwards to Donna-Buang, while southwards range and valley succeeded one another as far as the eye could reach. The position of Gilderoy, where we had intended to explore, could just be made out among the ranges about ten miles to the south-east. We returned by a more direct route, and from the Dee valley brought away several species of ferns and seedling plants, including an *Eriostemon*, probably *E. squamens*, some of which are destined to find their way into public gardens after a period of pot-life.

On the Monday we turned south-easterly and crossed the intervening Silurian country on our way to that portion of the State Forest between Warburton and the Britannia Creek. This formation carries vegetation somewhat resembling that about Ringwood, and appears at its best early in October, when a great variety of wild flowers may be obtained in bloom. The area has given many fine blooms to the Club's wild flower exhibitions. When examining a *Hakea rostrata* we were informed by Mr. Dowie, Forest Officer (whose duties for the day happily coincided with our intentions), that the Black Cockatoo is fond of the seeds of this shrub. The hard, woody pericarp splits open easily when ripe, and the birds choose the ripening season for the attack, leaving the forest shelter for the purpose. On leaving the Silurian, and mounting the granite slopes by the road leading up Yankee Jim's Creek to Old Warburton, we were enabled to examine the gum-tree known locally as "Silver-top" and "White Ironbark," and found it to be *Eucalyptus seiberiana*, characterized by the somewhat spiral fissures and ridges of the hard, dark bark and the silvery white upper branches. We had seen nothing of this tree on the dacite formation north of the Yarra. This gum, with *E. amygdalina*, Mountain Ash, and *E. obliqua*, Messmate, are the three principal forest trees of this part. On burnt-out areas fine young gums were growing. These, now a few feet high, will, if saved from fire, reach their commercial zenith at about the time when junior members of the F.N.C. have passed their prime. In the work of planting forests the pleasure is an unselfish one. It is in order that others may reap what is sown to-day—a quarter of a century later. By the roadside grew the only orchid seen, and this was a well-grown specimen of *Dipodium punctatum*, sometimes called "Native Hyacinth." The beautiful King Parrot, *Aprosmictus cyanopygius*, is reputed to be fond of the tubers, and

personally I hold this species of bird responsible for the disappearance of some species of orchids from a district or locality.

We lunched at the Britannia Falls—a cataract having a fall of about 60 feet in about four chains—and on our way home were courteously afforded an opportunity to pay a brief visit to Messrs. Cuming, Smith and Co.'s chemical works, in the western corner of the forest. There we saw the process of converting forest trees into charcoal, methylated spirit, formalin, acetic acid, &c.

The members of the party being all botanically inclined I am unable to give an account of the bird and insect life, but, generally speaking, insects and large birds, except parrots, were scarce, though small birds, such as Tits, Wrens, and the like, were numerous. In a "Spotted Gum" sapling by the roadside, near West Warburton, a nest, constructed of bark fibre, &c., about 6 or 7 inches deep, and about 3 or 4 inches across, and elliptical in vertical section, was noticed, and reached by means of a fence post. Careful examination failed to disclose an entrance, and it was only by burrowing one's finger through with some force that it was ascertained that two warm eggs were enclosed. We knew of no bird that so closes its nest up when leaving it temporarily, perhaps an ornithological member present could venture a guess at the kind of bird to which the nest belongs.*

On the whole the excursion was enjoyable and profitable, and the climb of nearly three thousand feet to "The Rock" as a one-day excursion can be recommended to anyone who desires to keep to beaten tracks, and at the same time enjoy the great beauty and variety of the trees and shrubbery passed *en route*. The distance from West Warburton station is probably a little over five miles, while Millgrove is even nearer, and were the tracks taken in hand by the Tourist authorities and improved in places, and a few sign posts put up, there would be no better outing to be obtained in the vicinity of Melbourne.—A. D. HARDY.

VICTORIAN FORAMINIFERA—RECENT AND FOSSIL.

By FREDK. CHAPMAN, A.L.S., F.R.M.S., Palæontologist to the National Museum.

(With plate).

(Read before the *Field Naturalists' Club of Victoria*, 14th March, 1910.)

It is hoped that the following remarks upon one of our most interesting groups of marine organisms may awaken in some of the members, either of the Field Naturalist's Club or the Microscopical Society of Melbourne, a desire for research; and that it may set them on the road to investigate some problems still open

* Mr. Kearthland informed the meeting that it was probably the nest of one of the *Acanthizas*.—A. D. H.

for workers which may eventually prove to be of much scientific value. Both phases of the study of Foraminifera—viz., the systematic and the biological—will equally repay the earnest worker. Systematic (geological and geographical) work on the Foraminifera will throw more light upon the numerous questions concerning their distribution, and also their behaviour under varying conditions of life. This will link up to biological investigation, involving their fascinating life-histories, of which I spoke at a former meeting, and so gain a clearer and deeper knowledge, not only of this group, but, indirectly, of all other related protozoans. The biological side appears to be left severely alone by amateur observers, perhaps on account of the initial difficulties of starting a marine micro-aquarium; but those that reside near the coast will have no trouble in that direction. All that is necessary is a wide-mouth pickle, or bell, jar, partly filled with sea-water, and supplied with the material to be observed. This is obtained from the red and green seaweeds found in low tide pools. A few bunches of the weed may be shaken and washed in the jar, leaving therein a few fronds to keep up the balance of conditions. The sandy material coming from the surface of the fronds often largely consist of foraminiferal shells in the living state. In the day time the living Foraminifera can be seen attached to the "light" side of the jar, with their pseudopods extended. Although rather "fickle fish" to catch and keep, it is remarkable how much a healthy Foraminifer will stand. As an instance, I may mention that, when living at Putney, near London, I received some exceptionally large examples of the shallow-water Foraminifer, *Polystomella crispa*, from Hornell's famous marine laboratory at Jersey. They survived the railway journey to London, enclosed in a corked tube, and after arrival through the post-office, exhibited their rare beauty in a way that was hardly expected. The leisurely manner in which they threw out and retracted their streaming, granular, and inosculating threads of protoplasm, afforded a charming sight under a black ground illumination, sufficient to turn any microscopist who saw them into an ardent and life-long student of that group of animals.

Amongst the biological problems ready to the hand of our Victorian naturalists may be mentioned the determination of the actual pelagic or floating foraminiferal fauna found along our coasts, and the recording of the phenomena connected with their reproduction; the occurrence of dimorphism in the recent and fossil Victorian species, the noting of generic forms which show the phenomenon of plastogamy, and the explanation of the problematic cause of fistulose outgrowths in the nodosarines and the polymorphines.

The systematist will also find his hands very full investigating the faunas of the shore sands, estuarine muds, or deeper

water deposits. Also, in the imperatively important work of defining the fossil faunas of our Tertiary strata, which, by the way, will favourably compare with the rich deposits of Italy and Spain and the West Indian Islands. A word of warning is here necessary to amateur workers. In sifting the material be perfectly certain that you do not invalidate your results by the accidental inclusion of a few grains of another deposit which may have been retained in the sieves; and it is a good rule to carefully clean the sieves before putting them aside. Further, never waste time on a deposit of doubtful horizon or locality, for good material is plentiful, and there are benevolent collectors of the larger fossils who are only too glad to find someone who can make a good use of their fossil cleanings.

Recent Victorian Foraminifera.—Our shore-lines afford a perfect harvest of foraminiferal shells, if searched at the right time and in the quieter indents. The shore sands of Hobson's Bay contain *Polystomella macella* and *Miliolina seminulum* in great abundance, together with some *Spiroloculina*, whilst the finer, silty portion, such as may be found adherent to the piles of piers and groynes, on the information of Mr. F. Barnard, sen., is full of the delicate bottle-shaped shells of the *Lagenæ* and the plaited shells of the minute hyaline *Bolivina*. The shore-sands of Altona Bay are especially rich in the *Polymorphinæ*, some of the specimens showing the curious oral outgrowth (fistulose condition) which appears to lead, morphologically, to the form *Ramulina*. Many beautiful and delicate species of Foraminifera may be collected on the retreating tide at Beaumaris, where, also, there is a large proportion of the carapaces of Ostracoda belonging to the genera *Pontocypris*, *Bairdia*, *Cythere*, and *Cytherella*. Not much attention has been directed to the deeper water fauna of Victoria and the vicinity, but the writer has now some material in hand from the trawler "*Endeavour*," which is giving very interesting results, and which will be embodied in a report to be published under the auspices of the National Museum.

Tertiary Foraminifera.—These are so important and deeply interesting as a whole, that time will not permit to do more than just mention the directions in which our investigations, up to the present, point us. One striking feature in the Tertiary foraminiferal fauna is the absence of the Nummulite from the Australasian region, although the genus occurs elsewhere in the Upper Oligocene, the age of which I take our oldest beds to be. The larger part of our Tertiary deposits, from the standpoint of the megascopic foraminiferal types, are comparable with the Miocene of the South of Europe, Asia, and the East Indian Archipelago, as well as parts of the West Indies. This is seen in the occurrence of certain forms restricted to definite geological horizons, as in the genus *Lepidocyclina*.

Another interesting point brought out by the study of the

Victorian fossil Foraminifera is the direct light it throws upon climate and depth of sea bottom. As regards the first, the Oligocene and Miocene, as elsewhere, enjoyed a sub-tropical climate, many forms, now only found in coral areas, being typical of our Balcombian and Janjukian strata. In later times, towards the Pliocene (Kalinan), the climate became much colder and perhaps even of lower temperature than at the present day.

As regards bathymetrical limits, certain forms indicate a shallow, shelving sea bottom, others a deep water habitat; while still others indicate estuarine conditions, with intercalated fluvial influence; and even a dune-sand deposit skirting a coastal margin, as shown by the occurrence of polished sand and shells due to æolian action.

Of older foraminiferal deposits there is very little to say, so far as our present knowledge goes. There are traces of what appear to be foraminiferal tests in the Devonian limestones of Gippsland. In the Silurian limestone of Cave Hill, Lilydale, the sandy coiled tests of *Ammodiscus* are not uncommon.

SOME PRACTICAL HINTS.

On the Collection of Recent Foraminifera.—The whitish tide-streaks left on a gently sloping shore by the retreat of the water consist of Foraminiferal shells, mostly dead, echinoid spines, fry of mollusca and seeds. Sometimes a particularly pure gathering of littoral Foraminifera may be made by scraping the surface of the sand carefully and lightly with a broad, sharp-edged spoon, the square-edged lid of a mustard tin or a bent up stiff card. The material obtained can be filled into a tin, and should be washed from saline matter as soon as possible.

The silt from estuarine mud deposits often contains a rich assemblage of the beautiful lagna shells; and these, if they be empty, can be separated by throwing the dried material on to a bowl of water, when they will float, leaving the heavier, minute sand particles to sink. This floating film of shells can be poured off into a second vessel and the water siphoned away, so that one is enabled to dry off the shelly material. Another method is to skim off the floating shells on strips of blotting paper, which can be easily dried.

A good method of procuring quantities of living Foraminifera is employed by Mr. J. J. Lister. A double sieve is used, the top being of horse-hair, which will allow the Foraminifera and little else to pass through, the lower being of bolting cloth, which retains the Foraminifera. This sieve is taken to low-tide pools, where the sea-weed is washed into it, generally with good results.

Dredgings from deeper waters are often rich in these microscopic shell deposits, especially in the proximity to currents and where there are calcareous rather than igneous rocks in the neighbourhood.

Living Foraminifera may be killed by putting them in a mixture of warm saturated solution of corrosive sublimate, 4 parts, and glacial acetic acid, 1 part. They should then be cleaned in water and placed in picro-carminé for some hours.

To preserve dredgings, use a 5 per cent. solution of formalin neutralized with a little powdered chalk.

A valuable reagent for decalcifying the foraminiferal tests for the purpose of observing the protoplasmic body is that known as Perenyi's fluid. It is as follows:—Nitric acid, 10 per cent., 4 vols.; abs. alcohol, 3 vols.; chromic acid, 5 per cent., 3 vols.

On the Collection of Fossil Foraminifera.—The calcareous clays afford the better preserved specimens. Sands are nearly always barren, owing to the dissolution of the shells by water percolating through the beds. In washing clays for the extraction of the Foraminifera, it must be borne in mind that this class of rocks, even the most tenacious, will freely disintegrate if first thoroughly dried. Pieces of the size of a walnut, or larger, may be dropped into a vessel of water, and left undisturbed until the whole has broken up into a flocculent mass, when the finer argillaceous and amorphous constituents may be separated by washing. The cleaning process is facilitated by pouring off most of the water and rapidly whirling or shaking the vessel until the fossil organisms are freed by friction from the obscuring clay particles. Example:—The Tertiary clays of Balcombe's Bay.

With limestones a different course of treatment is necessary. The specimens selected should be as friable as possible. They should be placed in a strong vessel, or, preferably, in a porcelain mortar, with enough water to just cover the fragments, and then gently pounded by as slight a pressure as will break down the material. Example:—The Tertiary limestone of the Filter Quarry at Batesford. In England this disintegration of refractory fossiliferous rocks is done by putting out the specimens during a sharp frost, and, although in this country such conditions would only be obtainable in the Australian Alps, yet the method could be resorted to by artificial means of freezing. In some exceptional cases even hard limestones will allow the foraminiferal tests to be separated by the coercive measures described above. The disintegrated rubble may then be washed, dried, and sifted, preparatory to sorting.

Sorting Foraminiferal Residues.—To render the selection of specimens easy, it is advisable to sift the dried material into grades of varying coarseness. A set of sieves will be found useful, having 30, 60, and 90 meshes to the linear inch. Advantage of the shape of the foraminiferal tests may be taken from the tendency of the more globular or cylindrical forms to roll on an inclined plane. The sorting of the first grade of siftings may be easily done with a lens, but the finer material will require

PLATE VII.

Fig. 1. x26

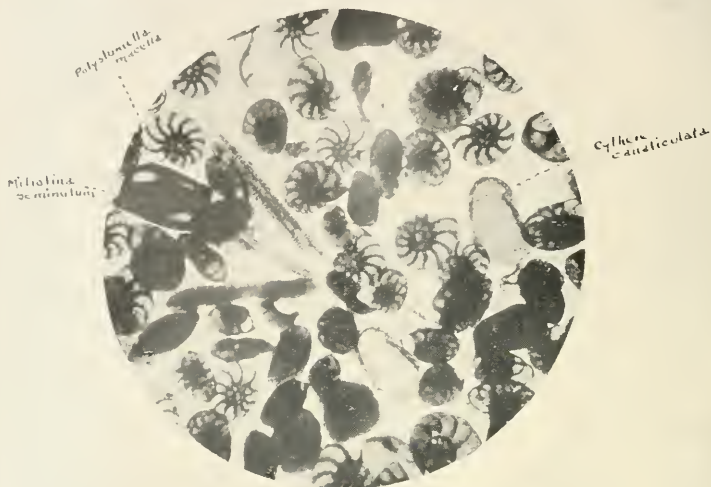


Fig. 2. x26



Micro-photo., F. C.

VICTORIAN FORAMINIFERA.

Fig. 1. Recent Foraminifera from St. Kilda Beach.

Fig. 2. Fossil Foraminifera from Balcombe's Bay.

the use of a 2-inch or 1-inch objective. A convenient sorting tray may be made of vulcanite, with a projecting $\frac{3}{16}$ -inch rim, the slide being made slightly larger than the ordinary 3-inch \times 1-inch slide.

Mounting Foraminifera.—For dry mounting a cheap and convenient slide may be made of a slip of 3 \times 1-inch wood, bored with a central hole of $\frac{3}{4}$ -inch or $\frac{7}{8}$ -inch diameter, or of thick cardboard of the same dimensions, perforated by a hole made with a gun punch. The wood or cardboard slip can then be glued to a piece of thin card, on which a patch of indian ink, slightly larger than the hole in the slide, has been painted. Where cabinet space is limited and specimens numerous, many shells may be mounted on one slide in which the cell is large, rectangular, and divided into spaces which are numbered. This can be covered with removable glass, and a reference index kept for each slide. The specimens may be gummed on separately, or, as in the composite slide, the whole surface may be prepared, and the specimen secured by the application of the moistened tip of a fine brush. To attach the specimens gum arabic may be used, but it should be rendered tough by the addition of a few grains of sugar or a few drops of glycerine to each ounce of liquid gum. A drop of oil of cloves introduced will prevent mould. Gum tragacanth gives good results, as it dries with a dull surface. It requires a little practice in its use, however, as it has the consistency of a stiff paste.

Transparent mounts of foraminiferal shells involve the cleaning of the tests. This is done by boiling in a weak solution of caustic potash, to remove the organic matter. After careful washing the material may be passed through absolute alcohol, turpentine, and finally into Canada balsam dissolved in xylol, in which it is mounted. If left long enough in the turpentine bath all air bubbles will be removed. In mounting, the heat employed should not be so great as to cause vapour bubbles to form in the tiny chambers of the shells; and to obviate this a steam bath should be used.

EXPLANATION OF PLATE.

Fig. 1.—Recent Foraminifera from St. Kilda beach. This sand contains the following Foraminifera:—*Miliolina seminulum*, L., sp.; *M. subrotunda*, Mont., sp.; *Discorbina dimidiata*, P. and J.; and *Polystomella macella*, F. and M., sp. Also separate valves of the ostracodes *Loxoconcha*, sp., and *Cythere canaliculata*, Reuss; together with numerous spines of *Echinocardium australe*, Gray. \times cir. 26.

Fig. 2.—Fossil Foraminifera, &c., from washings of Tertiary clay (Balcumbian age), at Balcombe's Bay, near Mornington. Containing the following Foraminifera:—*Bolivina punctata*, d'Orb.; *Lagena distoma*, P. and J.; *L. sulcata*, W. and J.; *Cristellaria crepidula*, F. and M., sp.; and *Globigerina bulloides*, d'Orb. Also a radiolarian, *Haliomma*, sp.; numerous shells of the pteropod, *Limacina tertiaria*, Tate, sp.; and calcareous spicules of an ascidian. \times cir. 26.

The photomicrographs are taken from slides in the cabinet of the National Museum by permission.

THE APPLE-NUT OF THE SOLOMON ISLANDS.—At various times peculiar vegetable formations, shaped like moderately sized apples, of a blackish-brown colour on the outside and excessively hard, have been found mixed with the coal used for the locomotives on the Victorian Railways, and their occurrence was recorded in this journal in May, 1906, vol. xxiii., page 4. They seem at first sight like the fruit of some palm, and had probably been in the hold of the ship which brought the coal to Melbourne. However that may be, specimens were sent to me for identification, and there are also specimens in the National Museum and at the Museum of Economic Botany, Melbourne Botanic Gardens. It is named at the latter Museum *Sclerosperma manni*, H. Wendl., a palm found in tropical Africa, and commonly known as Mann's Ivory-Nut Palm, while Mr. R. H. Walcott, of the National Museum, received the name from another authority as *Metroxylon vitiense*, Benth. and Hook., a palm belonging to the Fiji Islands. As it was desirable to have this matter cleared up, especially when specimens were displayed in public institutions, a sample was forwarded to the Director of the Royal Gardens, Kew, who courteously replied "The palm-nut sent for identification is apparently that of *Metroxylon amicarum*, Hodg." In the *Kew Bulletin* for 1897 there is an account of these nuts under the heading of Ivory Nuts in a report on the British Solomon Islands, and the references there to prices in Sydney show that these nuts are articles of commerce, and no doubt had been carried as cargo in the ships which afterwards loaded with coal. The report states that "These nuts are the fruit of a palm, *Metroxylon amicarum*, one of the sago-yielding palms. The species is, I believe, peculiar to the Solomons, and grows wild throughout the group in inexhaustible quantity. The nuts are exported as vegetable ivory, and are used for making buttons and similar small articles. Some years ago I made inquiries in London as to the market for these nuts, and ascertained that they were known in the trade as 'apple-nuts,' and that three Birmingham firms occasionally used them. I was informed that the chief objection to them was the hollow core through the middle, and their reluctance to take a black dye. More went to Germany and Vienna than to London. About three years ago the price of these nuts suddenly jumped from about £3 a ton in Sydney to £12, at which price a considerable quantity were sold, and the market probably overstocked. Their value has now relapsed to about £5 a ton in Sydney, at which figure there seems to be a good demand. The sudden inflation in value was due, as I was informed, to the demand of a Vienna firm, who used a considerable quantity for making the wheels of roller skates." It may be remarked that the vegetable ivory of commerce is the white seeds of an almost stemless palm known as *Phytelephas macrocarpa*.—D. MCALPINE.

THE
Field Naturalists' Club of Victoria.

(FOUNDED MAY, 1880).

MEMBERS,

31st MARCH, 1910

(With Date of Election and particulars of Branch of Study).

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Sep. 1889 † LEGGE, LIEUT.-COL. W. V., R.A., F.Z.S., M.B.O.U., Hobart.
Feb. 1893 * † LUCAS, A. H. S., M.A., B.Sc., Grammar School, Sydney, N.S.W.
Aug. 1882 RAMSAY, DR. E. P., F.R.S.E., &c., Sydney, N.S.W.

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Aug. 1906 Armitage, Jas. A., 510 Station-street, N. Carlton
April 1906 † Armitage, R. W., 441 Canning-street, Carlton Biology, Geol.
June 1906 † Audas, J. W., National Herbarium, S.Y. ... Botany
Feb. 1904 † Bage, Miss F., M.Sc., "Cranford," Fulton-st., St. Kilda ... General Biol.
June 1906 Bainbridge, J. W., Crown Lands Dept., M. ... Botany
Aug. 1889 † Baker, H. H., 78 Swanston-street, Melbourne Microscopy
May 1880 o Bale, W. M., F.R.M.S., Walpole-street, Kew Hydroids
May 1880 o Barnard, F., "Bracondale," Foley-street, Kew
May 1880 o * † Barnard, F. G. A., 49 High-street, Kew Ent., Bot. (Ferns)
Dec. 1909 Barr, Jas., 39 Queen-street, Melbourne
Sept. 1899 * † Barrett, C. L., *Herald* Office, Melbourne ... Orn. & Reptilia
May 1906 Bennett, W. J., "Riverside," Davidson-st., South Yarra
Dec. 1907 Bennetts, W. R., Pakington-street, Kew ... Pond Life
May 1880 o * † Best, D., 291 Little Collins-street, M. ... Ent. (Col.)
Nov. 1900 † Billinghurst, F. L., National Bank, Bacchus Marsh... Ent. (Col.)
Nov. 1904 Booth, J., "Orwilda Ruma," 25 Rathdown-st., Carlton ... Amphibia
May 1905 Booth, Miss D. E. H., 25 Rathdown-st., Carlton
May 1905 Booth, Miss E. S., "Oakover," Bell-st., S. Preston
Aug. 1906 Borlase, J., Tooronga-road, Malvern
Mar. 1907 Bothroyd, T. W., M.A., Tooronga-rd., Hawthorn

- May 1896 Brunning, J., Somerville
 Aug. 1909 Bury, F. C., Hoyt-street, Sandringham
 Dec. 1909 Bury, Miss E., State School, St. Kilda Park
 May 1897 * † Campbell, A. J., Elm-grove, Armadale ... Orn., Oology
 Dec. 1906 † Campbell, A. G., "Fernside Orchard," Pomonal,
viâ Stawell Orn., Oology
 Mar. 1909 † Carter, T., M.B.O.U., Broom Hill, W. Aust. Ornithology
 Mar. 1907 Catron, Jos., State School, Charlton
 Dec. 1902 Cayley, F. J., Werribee
 May 1902 † Chapman, F., A.L.S., F.R.M.S., Nat. Museum,
 Melbourne Geol., Palæon.
 July 1902 Clark, Alister, "Glenara," Bulla ... Ornithology
 Dec. 1908 Clarke, A. Rutter, Orrong-road, Toorak
 Mar. 1889 Cochrane, Miss S. W. L., 102 Drummond-street,
 Carlton Botany
 July 1882 * Coghill, G., 72 Swanston-street, Melbourne ... Botany
 Nov. 1906 † Cole, C. F., 28 Currajong-road, Auburn ... Ornithology
 May 1905 Coles, H. J., Bourke-street, Melbourne Ornithology
 Nov. 1905 Cormack, F. G., Mail Branch, G.P.O., M.
 Nov. 1902 Cowle, Miss L., c/o Mr. Priest, Devonport W.,
 Tasmania
 Dec. 1903 Cowle, Miss C., Prince's Terrace, S. Melbourne
 Aug. 1905 Cudmore, Mrs., "Springfield," Murphy-st., S.V.
 Feb. 1901 D'Alton, St. Eloy, C.E., Dimboola ... Botany
 Dec. 1892 Danks, A. T., Bourke-street, Melbourne
 July 1902 Davey, H. W., Cavendish-street, Geelong
 June 1909 Davis, Miss M., 337 Weston-street, Brunswick
 Nov. 1905 Dawes, Capt. R. J., 76 Morris-st., Williamstown
 Feb. 1903 Day, A. J., Lands Department, Melbourne
 May 1880 o * Dixon, J. E., 50 Swan-street, Richmond Ent. (Col. & Lep.)
 May 1904 Edmondson, C. H., 75 Riversdale-rd., Hawthorn
 Dec. 1901 Edmondson, Mrs. C. H., Riversdale-rd., Hawthorn
 Dec. 1909 Eltis, R. H. M., Livingstone-street, Ivanhoe
 April 1906 * † Ewart, Professor A. J., D.Sc., Ph.D., F.L.S.,
 National Herbarium, South Yarra .. Botany
 Sept. 1907 Farr, W. H., Flinders
 May 1890 * † Fielder, Rev. W., F.R.M.S., "Croft," Orrong-
 road, Armadale Micro. Biology
 May 1880 o * † French, C., F.L.S., F.E.S., Department of
 Agriculture, Entomological Branch, M. ... Entomology
 July 1883 * † French, C., jun., Department of Agriculture,
 Entomological Branch, Melbourne ... Entomology
 Mar. 1905 Fripp, S. J. A., 126 Wattletree-road, Malvern
 Aug. 1885 * † Frost, C., F.L.S., Scott-street, Canterbury ... Reptilia
 Mar. 1901 Fullard, A. F., Barker's-road, Hawthorn
 Oct. 1900 * † Fulton, S. W., 369 Collins-street, M. ... Crustacea
 July 1883 * † Gabriel, J., 293 Victoria-street, Abbotsford ... Oology
 June 1900 † Gabriel, C. J., 293 Victoria-st., Abbotsford .. Marine Conc.
 July 1908 Gabriel, J. E., Sale
 Nov. 1889 Gates, W. F., M.A., "Cullymont," Selwyn-rd.,
 Canterbury
 Oct. 1880 * † Gatliff, J. H., Commercial Bank, Lygon-street,
 Carlton Marine Conc.
 April 1909 Gillbanks, Miss G., Normanby-st., M. Ponds
 July 1883 † Godfrey, F. R., "Graylings," Alma-road, St. Kilda
 Aug. 1907 Goodson, W. E., State School, Doncaster
 June 1902 † Goudie, D., Sea Lake, Victoria ... Ent. (Lep.)
 May 1902 † Goudie, J. C., Sea Lake, Victoria ... Ornith., Ent.
 Dec. 1906 Gray, O., Wedderburn, Victoria
 Dec. 1909 Greenwood, Rev. A. J., Smythesdale

- Jan. 1901 Greenwood, G. F., "Garrell," Glen Eira-rd, Caul.
 July 1909 *† Haase, J. F., 367A Little Collins-st., M. ... Entomology
 June 1888 *† Hall, T. S., M.A., D.Sc., University, Carlton Gen. Bio., Geo.
 (Grapt.)
 Dec. 1905 Hamilton, Jas. T., F.L.S., Heidelberg-rd., Ivanhoe
 Sept. 1887 Hammet, E. R., State School, Loch
 Sept. 1909 Handley, Edgar, 74 Park-st., North Fitzroy
 Mar. 1908 Harding, A. D., c/o Huddart Parker and Co., M.
 Nov. 1901 *† Hardy, A. D., F.L.S., F.R.M.S., Forests Bot. (Freshwtr.
 Dept., Melbourne Algæ)
 Jan. 1904 † Hardy, Mrs. A. D., Studley-avenue, Kew ... Ornith., Oology.
 Aug. 1887 † Hart, T. S., M.A., School of Mines, Ballarat Geology, Bot.
 July 1899 Hartnell, W. A., "Irrewarra," Burke-road,
 Camberwell
 Dec. 1905 † * Harvey, J. H., A.R.I.V.A., 128 Powlett-st.,
 East Melbourne
 Jan. 1884 * Hill, G. R., "Glenrowan," Dandenong-rd.,
 Windsor
 Aug. 1909 Hill, G. F., "Glenrowan," Dandenong-road,
 Windsor Ornithology
 April 1901 † Hill, J. A., Kewell, *via* Murtoa Ent., Orn.
 Mar. 1907 Horner, Miss L., State School, Castlemaine
 Dec. 1907 Hosking, P. F., 101 Elgin-street, Carlton
 June 1909 Hull, Edw., 16 Vale-street, East Melbourne
 Mar. 1907 Jamieson, W. Boyd, M.A., State Sch., Red Bluff,
 Huon
 Feb. 1909 Jardine, B. A. L., Clermont, Queensland ... Ornithology
 April 1909 † Jarvis, E., Dept. Agriculture, Brisbane ... Entomology
 Jan. 1905 Jeffery, H. W., "Hazeldene," Cochrane-street,
 N. Brighton
 Nov. 1907 Johnson, H., 36 Rouse-street, Port Melbourne
 April 1905 † Jutson, J. T., "Oakworth," Smith-st, Northcote Geology
 April 1904 Kaufmann, J. C., LL.D., 21 Kooyongkoot-road,
 Hawthorn Pond Life, Mic.
 Feb. 1886 *† Keartland, G. A., Age Office, Collins-street, M. Ornith., Oology
 Feb. 1907 Kellock, C. F., Sloyd Centre, Castlemaine
 July 1908 Kelly, Reginald, Healesville Botany
 Nov. 1905 Kendall, H., 14 Rathmines-grove, Auburn
 Feb. 1906 Keppel, Miss K., Marysville
 Mar. 1888 *† Kershaw, J. A., F.E.S., National Museum, M. Zoology.
 July 1893 † Kitson, A. E., F.G.S., c/o J. S. Kitson, Con-
 tinuation School, Melbourne Geology
 June 1903 Kitson, J. S., Continuation School, Melbourne ... Geology
 Sept. 1908 Lazarus, Miss M., M'Kean-street, North Fitzroy
 Dec. 1902 *† Leach, J. A., M.Sc., Education Dept., M. ... Biology, Geol.
 Sept. 1907 Leach, Mrs. J. A., 48 Leopold-street, S. Yarra
 May 1903 Lees, E. H., C.E., F.R.A.S., Fairhaven, Mallacoota
 Oct. 1905 *† Le Souëf, D., C.M.Z.S., Royal Park.
 Parkville Ornith., Oology
 Aug. 1907 Lindsay, J., State School, Wannon
 Oct. 1907 Littlejohn, W. S., M.A., Scotch College, M.
 Feb. 1902 Luby, W. H., Spring-street, Preston
 April 1888 † Lyell, G., jun., F.E.S., Gisborne Ent. (Lep.)
 June 1887 *† Macgillivray, Dr. W., Broken Hill, N.S.W. Ornith., Oology
 Jan. 1907 Mackeddie, Dr. J. F., Collins-street, Melbourne
 Dec. 1902 † Madden, Hon. F., M.L.A., Studley Park, Kew
 Sept. 1908 Madden, Miss H., Retreat-road, Hampton
 Jan. 1908 † Mahony, D. J., M.Sc., Dept. of Mines, M. ... Geology
 Nov. 1904 † Maplestone, C. M., Eltham Polyzoa (recent,
 fossil)

- July 1908 Marks, Woolf, 413 Collins-street, Melbourne
 Dec. 1905 Marshall, Jas. E., Tamleugh North
 Nov. 1895 *† Mattingley, A. H. E., C.M.Z.S., Kew ... Ornithology
 Sept. 1908 Mattingley, Mrs. A. H. E., Kew
 April 1909 McAll, Geo., 254 Burnley-street, Richmond
 May 1885 †McAlpine, D., Department of Agriculture, M. Botany
 July 1894 * McCaw, W. J., 7 Liddiard-street, Glenferrie ... Zoology
 June 1904 McLennan, J. P., 10 Chaucer-st., Moonee Ponds Botany
 Jan. 1904 McMahon, W. Hugh, Liebig-street, Warrnambool
 Aug. 1899 McNab, L. K., "Braeside," Waiora-rd, Caulfield
 June 1904 Montgomery, Miss M. H., State Schl., Clifton Hill
 July 1899 Morgan, W. J., 11 Robb-street, Essendon
 Jan. 1909 Morris, Morris, Biological School, University
 Nov. 1884 Morrison, Dr. A., Rokeby-road, Subiaco, Perth,
 W.A. ... Botany
 Dec. 1905 Morrison, J. S., "Kooya," Eglinton-st., M. Ponds
 Oct. 1895 Mowling, G., "Athol," Auburn-road, Hawthorn
 April 1903 † Nicholls, E. B., 164 Victoria-st., North M. ... Ornithology
 May 1880 o† North, A. J., C.M.Z.S., Australian Museum,
 Sydney, N.S.W. ... Ornithology
 Dec. 1908 O'Donoghue, J. G., City-road, S. Melbourne ... Ornithology
 Dec. 1904 Oke, Chas., 56 Chaucer-street, St. Kilda ... Entomology
 May 1902 O'Neil, W. J., Department of Lands, Melbourne
 Mar. 1910 Petherick, E. J., F.R.G.S., Melbourne
 May 1880 o*† Pitcher, F., Botanical Gardens, Melbourne ... Botany
 Jan. 1909 Plumridge, C. L., Peel-street, Kew ... Botany
 June 1909 Plumridge, E. A., 76 Regent-street, Richmond
 Sept. 1901 † Pritchard, G. B., B.Sc., F.G.S., 22 Mantell-
 street, Moonee Ponds ... Geology, Conc.
 May 1892 Quiney, H., Mortlake ... Ornithology
 May 1909 Raff, Miss J., B.Sc., Stanley-st., Elsternwick ... Botany
 May 1905 Randall, Miss M., "Litchfield," Primrose-street,
 Essendon
 Jan. 1909 Read, W. J., 66 Smith-street, Kensington
 April 1909 Ritchie, Miss E. M., Hotham-st., Balaclava
 Aug. 1908 Robertson, J. L., M.A., 35 Hutcheson-st., Moonee
 Ponds
 June 1909 Robinson, John, 16 Vale-st., East Melbourne
 Jan. 1903 *Roger, W. H. A., 19 Wattletree-rd., Armadale Ent. (Lep.)
 May 1904 Rollo, Miss J., 65 Tivoli-road, South Yarra
 Mar. 1899 Ross, J. Andrews, Station-street, Jumbunna
 Nov. 1896 Ryan, Dr. C., 37 Collins-street, Melbourne ... Ornith.. Oology
 Jan. 1910 Ryan, Dr. E., Collins-street, Melbourne
 Jan. 1910 Ryan, Dr. T. F., Nhill
 Sept. 1908 Sarovich, Mrs. C. J., Beach-st., Port Melbourne
 May 1880 o*† Sayce, O. A., A.L.S., "Staplehurst,"
 Harcourt-street, Hawthorn ... Crustacea
 Jan. 1909 Scott, Alex. L., 27 Evelina-road, Toorak ... Geology
 Nov. 1885 Scott, W., 54 Fletcher-street, Essendon
 Mar. 1909 Searby, C., B.A., Continuation School, Melbourne
 July 1885 Searle, J., 274 Collins-street, Melbourne
 Oct. 1909 Semple, Dr. W. H., Kilmore
 May 1889 *† Shephard, J., Clarke-st., South Melbourne ... Pond life
 Oct. 1909 Simpson, S., State School, Glenroy
 July 1884 * Simson, Mrs. J., "Trawalla," Toorak
 July 1884 Simson, Miss, "Trawalla," Toorak
 May 1905 Skeats, Professor E. W., D.Sc., Univ., Carlton ... Geology
 June 1906 Slack, T., State School, Bacchus Marsh
 May 1880 o† Sloane, T. G., "Moorilla," Young, N.S.W. Ent. (Col.)
 May 1902 Smith, A. J., Port Albert

Dec. 1901	Somers, Dr. J., Edgeworth, Mornington	
Oct. 1903	Somerville, W., 16 Bellevue-street, Richmond	
Jan. 1903	Spark, J. M., Harding-street, Surrey Hills	
Aug. 1887	*† Spencer, Professor W. Baldwin, C.M.G., D.Sc., M.A., F.R.S., University, Carlton	... Biol., Zoology
Feb. 1882	† Spry, F., Napier-street, South Melbourne	... Entomology
Nov. 1908	St. John, P. R. H., Mason-street, South Yarra	Botany
Jan. 1908	Stephen, W. J., 32 Robinson's-road, Hawthorn	
Nov. 1880	Stickland, J., Latrobe-street, Melbourne	... Pond life
July 1885	*† Stickland, W., Latrobe-street, Melbourne	... Pond life
Nov. 1900	*† Sutton, Dr. C. S., Rathdown-street, N. Carlton	Botany
July 1886	*† Sweet, G., F.G.S., "The Close," Wilson-st., Brunswick	... Geology
May 1903	Thiele, A. O., Chatham road, Canterbury	
Dec. 1892	Thiele, A. F., Doncaster	
Oct. 1909	Thiele, E. F., Doncaster	... Ornithology
Jan. 1908	Thomson, Capt W. C., Ascot, Brisbane, Qld.	
Feb. 1904	Thomson, Dr. J. R. M., Hawthorn-rd., Caulfield	
Sept. 1900	† Thorn, W., Findon-st., Hawthorn	
April 1883	*† Topp, C. A., M.A., LL.B., Royal-crescent, Armadale	... Botany
Aug. 1907	† Tovey, J. R., National Herbarium, South Yarra	Botany
April 1904	Trebilcock, R. E., Wellington-street, Kerang	... Ent. (Lep.)
Oct. 1903	Tuckett, Jos. H., Neerim-road, Murrumbidgee	
June 1904	Turner, Miss E. J., "Torridge," Domain-road, S.Y.	
Jan. 1910	Twyford, J., 9 Villiers-street, Elsternwick	... Microscopy
Dec. 1908	Walcott, R.H., F.G.S., National Museum, M.	... Mineralogy
Nov. 1891	Walker, J. B., Mackillop-street, Melbourne	
Jan. 1908	Wallace, Rev. H., Frankston	
June 1904	† Waterhouse, G. A., B.Sc., F.E.S., Royal Mint, Sydney, N.S.W.	... Ent. (Lep.)
Sept. 1908	Waters, C., Continuation School, Melbourne	
Nov. 1901	† Weindorfer, G., "Roland Lea," Kindred, Tas.	Botany
Aug. 1904	Westley, Rev. A. H., The Vicarage, Drouin	... Ent. (Col.)
May 1906	Wettenhall, Dr. R., c/o Miss Clerk, Muir-st., Hawthorn	
May 1905	White, Miss R. E. J., D.Sc., Observatory Quarters, South Yarra	... Botany
June 1909	White, Mrs. W., Savings Bank, Malvern	
Sept. 1898	Wilcox, J., 4 Loch-street, Hawthorn	
Jan. 1901	Williamson, H. B., 52 Gertrude-st., Geelong	... Botany
Sept. 1907	Wilson, H. W., 105 Drummond-street, Carlton	Pond life, Geol.
July 1904	Wilson, J., Moorabbin Pharmacy, Cheltenham	
May 1880	o*† Wisewould, F., Imperial Chambers, 408 Collins-street, Melbourne	
July 1902	Wisewould, Miss G., Seymour-road, Elsternwick	
Oct. 1898	Wollen, A., Nar-Nar-Goon	... Orn., Ent.
Mar. 1908	Wrigley, Miss E., 117 Racecourse-road, Newmarket	

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Zoologist.

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- „ Government Botanist, Melbourne.
- „ Department of Mines and Water Supply, Melbourne.
- „ „ Agriculture, Melbourne.
- Transactions and Proceedings of Royal Society of Victoria, Melbourne.
- Transactions and Proceedings of Royal Geographical Society (Victorian Branch).
- The Emu: the Journal of the Australasian Ornithologists' Union.
- The Geelong Naturalist (Geelong Field Naturalists' Club).

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- Publications of the Department of Mines and Agriculture.
- „ Department of Fisheries.
- „ Government Botanist, Sydney.
- „ Australian Museum, Sydney.
- „ Australasian Association for Advancement of Science.
- Journal and Proceedings of Royal Society of New South Wales.
- Proceedings of the Linnean Society of New South Wales.
- The Australian Naturalist (New South Wales Naturalists' Club, Sydney).

QUEENSLAND—

- Publications of the Department of Agriculture.
- Proceedings of the Royal Society of Queensland.
- The Queensland Naturalist (Brisbane Field Naturalists' Club).

SOUTH AUSTRALIA—

- Proceedings of Royal Society of South Australia.

TASMANIA—

- Papers and Proceedings of Royal Society of Tasmania.
- The Tasmanian Naturalist (Tasmanian Field Naturalists' Club, Hobart).

WESTERN AUSTRALIA—

- Records of the Western Australian Museum, Perth.
- Journal of the West Australian Natural History Society, Perth.

NEW ZEALAND—

- Transactions of the New Zealand Institute, Wellington.
- Records of the Canterbury Museum, Christchurch.

GREAT BRITAIN—

- The Selborne Magazine: the Journal of the Selborne Society, London.
- Knowledge (London).
- Science Gossip and Country Notes and Queries (London).

EUROPE—

- Mitteilungen aus dem Naturhistorischen Museum, Hamburg.
- Bulletin of the Geological Institute, University of Upsala, Sweden.

ASIA—

- Annotationes Zoologicae Japonensis (Tokyo Zoological Society, Japan).

NORTH AMERICA—

- Transactions of the Nova Scotia Institute.

UNITED STATES—

- Publications of the Smithsonian Institute, Washington, U.S.A.
- Publications of the American Museum of Natural History, New York.
- Proceedings of the Academy of Natural Sciences, Philadelphia.
- Proceedings of the Boston Natural History Society.
- Publications of the Field Columbian Museum, Chicago.
- Publications of the Missouri Botanical Gardens, St. Louis, Mo.
- Transactions of the Wisconsin Academy.
- Bulletin of the Buffalo Society of Natural Science.
- Bulletin of the Wilson Ornithological Club, Oberlin, Ohio.
- Minnesota Botanical Studies, University, Minnesota.

UNITED STATES—*continued.*

Pomona Journal of Entomology, Pomona College, Claremont, Cal.
 Proceedings Hawaiian Entomological Society.

SOUTH AMERICA—

Revista do Museo Paulista, S. Paulo, Brazil.

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The Author of each article is responsible for the facts and opinions recorded.

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